GRADED WORK

IN

ARITHMETIC

S. W. BAIRD

XI

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FOURTH·YEAR

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IN

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BY

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FOURTH YEAR

INTERMEDIATE GRADES

NOTE

IN the "Fourth Year," designed for intermediate grades, review of the third year's work is followed by exercises in numbers of any magnitude. The fundamental operations are more formally treated, more advanced work is given in fractions, — common and decimal, — and business applications, including bills and accounts, are further extended.

In connection with denominate numbers some simple geometrical conceptions are developed, and the problems bearing thereon explain the applications to such practical measurements as carpet laying, plastering, etc.

The drills, which are continued in this book, are designed to assist the pupil to attain skill in computing, and habits of accuracy; and the problems are presented in a form calculated to develop clear reasoning power.

CONTENTS

Read the following numbers :

	a.	b.	c.	d.
1.	462	9004	32,647	380,067
2.	506	7605	46,802	580,692
3.	1463	9042	38,069	400,089
4.	3407	3006	84,003	790,106
5.	8049	8976	90,004	1,381,601

Write the following in columns of ten numbers each, and find the sum :

1. Two thousand 3 hundred fifty-nine; three hundred twenty-nine; nine hundred six; seven thousand thirty-six; eight thousand 7 hundred forty-nine; 29 thousand 3 hundred; 8 hundred twenty thousand two hundred nine; seven hundred two; 6 hundred thousand; seventy-nine.

2. Five thousand fifty; nine hundred thousand sixty; 801 thousand forty-seven; sixty thousand 3 hundred four; seven hundred thousand; 90 thousand 9 hundred nine; 79 thousand 3 hundred; 8 thousand four hundred; 999 thousand 9 hundred; one million three hundred thousand thirty-nine.

I. ORAL WORK

1.	2.	3.	4.	5.	6.	7.	8.
60	41	54	68	56	71	70	44
−49	−28	−37	−49	−18	−29	−57	−37

9.	10.	11.	12.	13.	14.	15.	16.
45	34	65	53	54	90	46	150
−18	−17	−36	−46	−18	−28	−27	−81

II. ORAL WORK

1.	2.	3.	4.	5.	6.	7.	8.	9.
24	14	31	25	43	45	102	106	109
×3	×2	×3	×3	×4	×4	×4	×4	×5

10.	11.	12.	13.	14.	15.	16.	17.	18.
210	350	320	304	410	509	710	806	810
×3	×4	×5	×5	×6	×6	×8	×8	×9

III. WRITTEN WORK

Add:

1. $2,378 + 248 + 569 + 92 + 540 + 3,378 + 8,306$
2. $3,838 + 839 + 256 + 63 + 705 + 3,001 + 7,006$
3. $4,726 + 1,952 + 2,467 + 903 + 875 + 63 + 906$
4. $859 + 748 + 3,641 + 8,201 + 869 + 3,064 + 9,005$

IV. WRITTEN WORK

Subtract:

	a.	b.	c.
1.	789 from 900	6432 from 8001	3780 from 5460
2.	634 from 743	3862 from 5000	6543 from 7032
3.	386 from 897	7206 from 8427	8999 from 9000

Divide:

a.	b.	c.	d.	e.
1. 26 ÷ 2	38 ÷ 2	68 ÷ 2	100 ÷ 2	612 ÷ 2
2. 36 ÷ 3	58 ÷ 2	94 ÷ 2	120 ÷ 3	612 ÷ 3
3. 34 ÷ 2	76 ÷ 2	78 ÷ 2	210 ÷ 3	612 ÷ 6

Divide:

a.	b.	c.	d.	e.
1. 140 ÷ 2	408 ÷ 4	168 ÷ 2	396 ÷ 6	384 ÷ 4
2. 144 ÷ 3	348 ÷ 4	168 ÷ 4	156 ÷ 2	384 ÷ 6
3. 276 ÷ 2	348 ÷ 3	168 ÷ 8	156 ÷ 3	324 ÷ 2
4. 408 ÷ 2	420 ÷ 4	396 ÷ 3	384 ÷ 2	324 ÷ 3

Add:

1.	2.	3.	4.
$254.48	$94.00	$468.57	$927.48
7.56	6.85	32.98	76.44
.95	.78	6.88	7.07
38.20	275.23	.74	753.00
808.73	583.17	432.39	768.19

Multiply:

a.	b.	c.	d.
1. 121 by 14	427 by 32	387 by 29	372 by 64
2. 349 by 26	563 by 43	672 by 37	726 by 68
3. 729 by 18	726 by 38	763 by 73	397 by 87

I. ORAL WORK

1. At $ .05 each how many melons can you get for $ .45 ?

2. If $ .45 is equally divided among 5 boys, how many cents will each boy receive ?

3. A man paid $ 45 for 5 calves. How much was that apiece ?

4. At $ 5 each how many sheep can be bought for $ 45 ?

5. At $ .05 per quart how many quarts of berries can I get for $ 45 ?

II. ORAL WORK

Divide:

	a.	*b.*	*c.*
1.	$ .60 ÷ $ .05	$ .72 ÷ $ .08	$ 63 ÷ 7
2.	$ .60 ÷ 5	$ .72 ÷ 8	$ 63 ÷ $ 7
3.	$ 60 ÷ 5	$ 72 ÷ 8	$ .63 ÷ $ .07
4.	$ 60 ÷ $ 5	$ 72 ÷ $ 8	$ .63 ÷ 7
5.	$ 60 ÷ $ .05	$ 72 ÷ $ .08	$ 63 ÷ $ .07

III. WRITTEN WORK

Find differences between:

	a.	*b.*
1.	29384 and 14967	48000 and 33672
2.	46789 and 27306	72010 and 29846
3.	79064 and 8706	59604 and 31842

Divide:

	a.	b.	c.	d.
1.	338 ÷ 13	3630 ÷ 15	9641 ÷ 31	6273 ÷ 51
2.	308 ÷ 14	4704 ÷ 21	7392 ÷ 32	9438 ÷ 66
3.	630 ÷ 15	8946 ÷ 21	9882 ÷ 81	9309 ÷ 87
4.	504 ÷ 21	9284 ÷ 22	8484 ÷ 42	9064 ÷ 88

II. WRITTEN WORK

1. I bought 180 lb. of meat at $.09 per pound. Find the cost.

2. A farmer picked 12 bu. 2 pk. of apples from each of 8 trees. If he sells the apples at $.55 a bushel, how much does he receive for them?

3. Find the cost of 2½ doz. chairs at $2.75 apiece.

4. A man earns $95 a month and spends $48.37 a month. How much does he save in a year?

5. I paid $1620 for 45 cows. How much was that apiece?

6. If a man buys a ton of hay, how many pounds will he have left after using 4 cwt.?

7. I paid $10.08 for ½ a gross of collars. How much was that apiece?

8. I paid $51.20 for 32 yd. of silk. How much was that a yard? How much would 1½ yd. cost at the same rate?

1. At $.05 a pound, find the cost of 25 lb. of sugar.

2. A man earns $2.50 a day. How many days must he work to earn $5 ? $10 ? $12.50 ?

3. What will be the cost of 10 yd. of silk at $1.60 a yard ?

4. A boy had $1. After spending 60¢ and earning 90¢, how much money had he ?

5. A coal dealer bought 100 tons of coal at $2.50 a ton, and sold it at $3 a ton. How much did he gain ?

6. Find the cost of 2 cwt. and 25 lb. of meal at 2¢ per pound.

7. A boy makes 30¢ a day delivering morning papers and 20¢ delivering evening papers. How much does he make in a week ?

8. A man worked 10 days and received $18. At what rate per day was that ? If he spends 70¢ a day, how long will it take him to save $6.60 ?

9. How many hours and minutes are there from 8.30 A.M. to 2.15 P.M. ?

10. Mary paid 15¢ for $\frac{1}{4}$ lb. of coffee. How much would 3 lb. cost at the same rate ?

Multiply by 8 :

	a.	b.	c.	d.
1.	$ 8.46	$ 13.81	$ 137.40	$ 2130.20
2.	$ 9.23	$ 17.06	$ 264.79	$ 1473.16
3.	$ 9.08	$ 36.42	$ 486.37	$ 1938.72
4.	$ 10.57	$ 27.39	$ 732.09	$ 1637.43

Subtract :

	a.	b.
1.	$ 84.28 from $ 94.00	$ .76 from $ 41.62
2.	$ 34.27 from $ 80.00	$ .79 from $ 83
3.	$ 79.50 from $ 90.40	$ 1.36 from $ 27
4.	$ 49.79 from $ 59.95	$ 20 from $ 81.30
5.	$ 9.73 from $ 44	$ 19½ from $ 36.75

Divide :

	a.	b.	c.
1.	$ 483 by 21	$ 756 by $ 36	$ 4662 by 42
2.	$ 4.83 by 21	$ 7.56 by $ .36	$ 4662 by $ .42
3.	$ 483 by $ 21	$ 756 by $ .36	$ 46.62 by 42
4.	$ 4.83 by $ .21	$ 7.56 by 36	$ 46.62 by $ .42
5.	$ 483 by $ .21	$ 756 by 36	$ 4662 by $ 42

6. Divide by 32 :

$ 992 ; $ 9.92 ; $ 2976 ; $ 29.76 ; $ 297.60.

7. Divide by 47 :

$ 18189 ; $ 181.89 ; $ 1818.90 ; $ 20022.

1. How much must I pay for 50 marbles at the rate of 5 for 1 cent?

2. How much will 7 baskets of peaches cost at $ .90 a basket?

3. At $ 10 a ton, how much will 5 cwt. of hay cost?

4. How much will 42 eggs cost at 24¢ a dozen?

5. At the rate of 3 apples for 2 cents, how many apples can you buy for $ .48?

6. Find the cost of $2\frac{1}{2}$ gal. of vinegar at $ .10 a quart.

7. If 3 lb. of coffee cost $ 1.20, how much will 6 lb. cost?

8. A man bought 20 ℔. of sugar at $ .05 a pound, and paid for it with 4 doz. eggs. How much was allowed for the eggs per dozen?

9. How many chickens at $ .35 each will pay for 21 qt. of berries at 5¢ a qt.?

10. Find the cost of 10 cans of salmon at 22¢ a can.

11. Find the cost of 1 doz. cans condensed milk at 18¢ per can.

12. How many square feet are there in the top of a table 1 yd. long and 2 ft. wide?

13. How many gallons of molasses at 40¢ a gallon can be bought for $ 3.60?

Add:

1.	2.	3.	4.
$ 384.23	864.37	$ 9006.21	$ 8671.43
76.28	49.36	308.25	7869.21
37.09	7.84	47.98	327.46
460.74	.96	7.35	1832.70
382.96	1.38	29.63	150.07
540.04	39.63	469.76	20.93
709.38	724.72	7030.06	8.37

Find the total cost of the following:

32 bu. wheat at $ 0.85 . . . $ 27.20
85 bu. potatoes at $ 0.75 . . .
125 bu. turnips at $ 0.40 . . .
128 bu. corn at $ 0.65 . . . .
36 bu. plums at $ 1.75 . . .
Total cost . . . . . $

1. From seven thousand three hundred forty-nine dollars and thirty cents take one thousand thirty-three dollars and nine cents.

2. Divide the following numbers by 49:
15729; 27636; 36162; 49294; 92864; 12838.

1. A man bought 64 sheep for $ 400. If he sells ½ of them at $ 6.75 apiece, and the remainder at $ 6.50 apiece, how much does he gain?

2. Find the cost of two turkeys at 18¢ a pound, if one weighs 8 lb. 9 oz., and the other 9 lb. 7 oz.

3. If 21 bbl. of cement cost $ 44.10, how much will 28 bbl. cost?

4. If 28 wagons cost $ 3360, what is the cost of 14 wagons of the same kind?

5. If 36 acres of land cost $ 1080, what is the cost of 12 acres?

6. How long will it take a man to walk 1440 miles, if he walks 2½ miles an hour, and 6 hr. a day?

7. A miller bought 98 bu. of corn for $ 44.10, and sold it at 53¢ a bu. How much did he gain?

8. A tailor bought 9 pieces of cloth, each containing 36 yd., at $ 1.20 a yard. How much did it cost him?

9. A grocer bought a barrel of molasses containing 31½ gal. He sold it at 12¢ a quart. If it cost him $ 12.60, how much did he make?

10. Find the cost of 50,000 lb. of coal at $ 2.75 a ton.

11. Find the cost of 12 lb. 7 oz. of cheese at 16¢ a pound.

1. At 3¢ a mile, how much will it cost to ride on the cars 150 miles?

2. I bought 3 doz. oranges at 28¢ a dozen. I gave the clerk a silver dollar. What change should I receive?

3. How many square feet are there in a floor 10 ft. 6 in. long and 8 ft. wide?

4. I paid $3.60 for 30 yd. of muslin. What was the price per yard?

5. If 3 quarts of molasses cost 30¢, how much must be paid for 3 gal. 2 qt.?

6. When maple sirup costs 48¢ a gallon, what is the cost of 3 pt.?

7. When butter is worth 32¢ a pound, how much must be paid for 12 ounces?

8. If a man can walk 15 miles in 5 hours, how many hours would he take to walk 150 miles?

9. At the rate of 3 cigars for 25¢, how many can be bought for $2?

10. How many quarts are there in a barrel containing $2\frac{1}{2}$ bu.?

11. If a boy can earn a certain sum of money in 30 days, in how many days can 3 boys earn the same sum?

Divide:

	a.	b.	c.
1.	38649 ÷ 36	38946 ÷ 39	386457 ÷ 38
2.	72806 ÷ 47	72064 ÷ 27	270653 ÷ 63
3.	49603 ÷ 28	38062 ÷ 67	849672 ÷ 78
4.	30601 ÷ 56	70906 ÷ 75	724369 ÷ 87

Find the missing numbers:

1.	2.	3.
384692	708494	3864938
279684	627538	7247163
539246	27684	8702071
784321	417984	386532
743284	3654	79654
726398	189372	7293846
******	******	*******
3812303	2460489	31072969

Add:

1. 4 ft. 2 in. + 7 ft. 9 in.
2. 9 hr. 45 min. + 12 hr. 15 min.
3. 29 yd. 1 ft. + 12 yd. 1 ft.
4. 21 gal. 1 qt. + 16 gal. + 3 qt.

Find the amount of the following bill:

100 lb. sugar   at $ .05½ . . . $
50 lb. coffee   at   .35   . . .
120 bars soap   at   .08   . . .
12 bbl. apples at 1.85   . . .
8 lb. tea   at   .58   . . .
24 bbl. flour   at 4.25   . . .
                                      ‾‾‾‾‾
Amt. . . . . . $

II. ORAL WORK

1. At 50¢ per pound, how many pounds of tea can be bought for $2? $4? $8? $26? $12½? $20.50?

2. At 25¢ each, how many boxes of sardines can you get for $2? $3? $10? $25? $9.50? $12.75?

3. At 20¢ each, how many cans of tomatoes can I buy for $.80? $1? $2? $3.20? $4.60? $5⅘?

4. Find the cost of 1 doz. handkerchiefs at 25¢ apiece.

5. If you can get 6 lb. of sugar for $1, how many pounds can you get for $5½?

6. At 50¢ each, how many penknives can be bought for $10.50?

1. I bought 25 horses for $ 3250. After keeping them a week at an expense of $ 1.30 per head, I sold 12 of them at $ 140 each, and the remainder at $ 145 each. What was my gain?

2. A dealer bought 53 turkeys for $ 39.75. At what price per pair must he sell them to gain $ 13.25?

3. I bought 90 cows at $ 24 each, and paid $ 1000 cash, and the remainder in flour at $ 4 a barrel. How many barrels were required?

4. A farmer sold 54 lb. of butter at 22¢, and 30 doz. eggs at 20¢. He received in payment 24 lb. of sugar at 9¢, and the balance in cash. How much cash did he get?

5. A man has an orchard containing 290 trees. How much are the apples worth, at $1.85 a barrel, if each tree yields 4 bbl.?

6. I bought 7 sideboards at $ 37 each. At how much apiece must I sell them to gain $ 35?

7. A miller mixes 24 bu. of oats worth 25¢ a bushel with 26 bu. of rye worth 50¢ a bushel. How much is a bushel of the mixture worth?

8. A merchant sold 234 bu. of potatoes for $ 175.50. How much was that per bushel?

9. My parlor is 18 ft. square. How many square yards of carpet will it require?

1. A man lacks $874 of having money enough to pay for 331 acres of land at $54 an acre. How much money has he?

2. A farmer had 192 bu. of apples. He sold $\frac{3}{8}$ of them at 60¢ a bu., and the remainder at $.65 a bu. How much did he receive for them?

3. I bought tea for $12.75, ribbon for $5.75, a baseball for $.50, a hat for $1.90, salt for $1.35, tomatoes for $4.35, and potatoes for $9.50. How much less than $50 did all cost?

4. How much will 66 tons of coal cost if 33 tons cost $206.25?

5. How many hours and minutes is it from half-past 10 o'clock Thursday afternoon to quarter-past 9 o'clock Friday morning?

6. Find the cost of $\frac{1}{2}$ a gross of slates, if 84 slates cost $7.56.

7. Find the average price per pound of 24 lb. of tea, if 18 lb. cost 50¢ per pound, and the remainder cost $1 per pound.

8. If 210 barrels of flour cost $892.50, how much will 124 barrels cost?

9. If I buy 26 calves at $2.25 each, and 24 at $6.25 each, what is the total price paid?

Where more than three figures are employed to express numbers they are divided into groups called **Periods.** The first group of three figures, counting from the right, constitutes the *units' period;* the second group of three figures constitutes the *thousands' period;* the third group the *millions' period;* the fourth group the *billions' period;* the fifth group the *trillions' period.* The names of a few periods above trillions are: quadrillions, quintillions, sextillions, septillions, and octillions.

	TRILLIONS	BILLIONS	MILLIONS	THOUSANDS	UNITS
Read the following numbers:	763,	684,	367,	487,	324
	749,	608,	437,	306,	420
	9,	300,	706,	370,	706
		29,	000,	700,	007
		163,	005,	308,	726
	189,	726,	472,	396,	504
	206,	410,	000,	320,	496
	700,	300,	010,	604,	729
		7,	300,	400,	002
		760,	380,	000,	960
	70,	000,	720,	900,	000

For convenience in reading, the periods are some-
times separated by commas.

Point off and read the following:

	a.	b.	c.
1.	9368	7638492	48460127384
2.	70647	79064283	109607245506
3.	126397	738472936	796432897481615

Every period, except the highest or left-hand period
must contain three figures.

Express by figures:

1. Forty-five thousand three hundred twenty-nine.

2. Six hundred eighteen thousand seven hundred
forty-three.

3. Three hundred seventy-six thousand.

4. Eight hundred forty thousand nine hundred six.

5. Nine hundred sixty-two thousand fifty.

6. One million thirty-seven thousand thirty-seven.

7. Three hundred sixty-three million four hundred
thousand seven hundred nine.

8. Twenty-six billion twenty-six million seventy-
eight.

1. Find the sum of seven hundred thirty-six thousand four hundred twenty-three, nine hundred three thousand five hundred six, one hundred thousand seventy, sixty thousand eighty.

2. Add two million seven thousand thirty-five, fourteen million three hundred thousand two hundred thirty-seven, four hundred thousand thirty-eight.

3. Add forty thousand four hundred five, three hundred thousand two hundred twenty-four, sixty-nine thousand sixty-nine, five hundred thirty thousand five hundred thirty.

4. Subtract three hundred fifty-four thousand three hundred forty-three from seven hundred thousand seven hundred.

5. From one million one hundred thousand four hundred sixty-five take nine hundred twenty-three thousand seventy-nine.

6. From two billion sixty million one thousand one take seventy-nine million seventy-nine thousand seventy-nine.

7. Find the sum of three hundred ninety-six thousand three hundred eighty-seven and one million one hundred thirty-two thousand five hundred fifty-four.

Add:

1.	2.	3.
43,726	7,265,849	460,127,483
3,846	2,640,982	82,607,589
92,364	396,387	38,741
154,679	4,000,768	763,549
700,457	708,542	7,842,763
6,000,739	2,863,274	38,427,654
7,465	27,394,682	4,584,659
36,301	73,890	37,000,842
743,396	149,543	122,784,893
7,243,875	92,365,389	763,417,376

1. Find the sum of three hundred twenty-one thousand six hundred thirty-four dollars twenty-eight cents, eighty-nine thousand three hundred dollars twenty-seven cents, nineteen thousand three hundred forty-two dollars seventy-five cents.

2. From 2 billion 777 million 336 thousand 173 dollars and 37 cents, take 1 billion 205 million 301 thousand 392 dollars and 89 cents.

3. Add $3764.43, $906.38, $74938.92, $86432.84, and $4715.21.

Subtract:

	a.	b.
1.	936423 − 408602	984631 rd. − 364729 rd.
2.	$ 3964.32 − $ 1369.46	832572 ft. − 706539 ft.
3.	$ 12684.72 − $ 8670.75	1384762 T. − 923706 T.

Multiply:

	a.	b.	c.
1.	324 × 20	742 × 320	$ 432 × 390
2.	768 × 40	596 × 460	$ 7.96 × 480
3.	872 × 60	934 × 780	$ 837 × 670
4.	593 × 70	386 × 850	$ 5.98 × 740
5.	684 × 90	846 × 980	$ 963 × 870

1. There are 1760 yards in 1 mile. How many yards are there in 560 miles?

2. There are 5280 feet in 1 mile. How many feet are there in 780 miles?

3. There are 8766 hours in 1 year. How many hours are there in 240 years?

4. There are 63360 inches in a mile. How many inches are there in 560 miles?

Multiply :

	a.	*b.*	*c.*
1.	9,684 by 316	70,635 × 860	8,964,372 × 764
2.	8,932 by 329	93,268 × 872	2,065,376 × 809
3.	7,060 by 456	60,606 × 909	8,453,769 × 964
4.	9,382 by 504	80,096 × 989	7,392,763 × 592
5.	7,293 by 729	76,654 × 397	6,304,507 × 908

1. Find the value of 19 tanks of oil, each tank containing 8683 gallons, at 8 ¢ a gallon.

2. Find the amount of the following bill :

WILKESBARRE, PA., Aug. 30, 1898.

WILLIAM ANDREAS,

Bought of JOHNSON & POWELL.

425 bbl. Apples, Holland Pippins, at $ 2.75 $

364 " " Orange " " 3.75

475 " " Nyack " " 2.50

165 " " Summer " " 3.25

Amount . . . . . $

3. Find the cost of a piece of land 25 ft. wide and 125 ft. deep at $.24 a square foot.

New York, Oct. 21, 1897.

C. W. Dodson,

Bought of McCahan & Cooper.

6 boxes Raisins, 174 lb., at 8¢ $13.92
4 barrels Sugar, 1284 lb., at 5¢ . . . .
12 boxes Macaroni, 300 lb., at 9¢ . . .. .
132 pounds Butter at 28¢ . . . . . .
16 barrels Sirup, 644 gal., at 19¢ . . . .
14 boxes Soap at $2.25 . . . .
Total amt. . . . . $

The **Parenthesis** ( ) is used to show that the num-
bers inclosed by it are to be considered as *one number*.
Thus, $10 - (3 + 4)$ means that the sum of 3 and 4 is
to be subtracted from 10.

Find the values of:

1. $(\$191.60 + \$3000.90) \times 23$

2. $\$729.31 - \$169.40 + \$32.50$

3. $\$9376.42 - (\$860 \times 7) + \$189.79$

4. $(\$968.42 - \$896.21) \times 175$

5. $(\$6394.72 + \$9637.21) - (\$964 \times 12)$

6. $(\$563.84 \times 75) + \$396.21 - \$187.$

1. If it requires 91,378 bricks to build a house, how many bricks will be required to build 68 houses of the same kind?

2. Parrish & Co. at one time bought 248 acres of coal land at $7575 an acre; at another time, 468 acres at $8792 an acre. Find the total cost.

3. A miller bought 3046 bu. of wheat, twice as many bushels of corn, and three times as many bushels of buckwheat. He paid 80¢ a bushel for the wheat, 48¢ for the corn, and 52¢ for the buckwheat. Find the cost of all.

4. William Brown willed $8365 to his daughter, three times as much to his son. What he gave to both was $2460 more than he gave to his wife. How much did his wife receive?

5. A, B, and C entered into partnership, with a joint capital of $58,000. A put in $13,610; B put in three times as much as A, lacking $785. How much did B and C each put in?

6. A dealer bought 125 barrels of apples at $1.40 a barrel. He found that 20 barrels were damaged. He sold the remainder at $1.90 a barrel. Did he gain or lose, and how much?

7. 160 is 9 less than $\frac{1}{4}$ of a certain number. Find the number.

Divide:

	a.	*b.*
1.	3358 by 23	168,349 by 127
2.	3528 by 23	284,635 by 165
3.	7864 by 59	690,014 by 381
4.	59,684 by 86	765,401 by 463
5.	87,004 by 98	872,476 by 542

Divide :

	a.	*b.*
1.	9,163,842 ÷ 3146	31,317 bu. ÷ 13 bu.
2.	8,672,432 ÷ 4327	91,200 gal. ÷ 76 gal.
3.	6,382,471 ÷ 5394	145,890 ft. ÷ 90 ft.
4.	70,014,162 ÷ 68,429	178,857 in. ÷ 63 in.
5.	763,849,216 ÷ 75,301	666,468 mi. ÷ 108 mi.

Divide:

	a.	*b.*
1.	145,890 ft. ÷ 84	$ 191,308 ÷ $ .26
2.	178,856 in. ÷ 88	$ 530,010 ÷ $ .65
3.	666,468 mi. ÷ 129	$ 4543.38 ÷ $ .86
4.	126,498 bbl. ÷ 152	$ 4773.86 ÷ $ .91
5.	105,056 yd. ÷ 148	$ 6021.75 ÷ 93
6.	$ 963,820 ÷ 725	$ 2123.42 ÷ 26

1. At $ 36 an acre, how many acres of land can be bought for $ 171,216 ?

2. How many horses at $ 125 each will $ 37,500 buy ?

3. How many shares of bank stock at $ 97 a share can be bought for $ 84,196 ?

4. If each bale contains 475 lb., how many bales can be made from 92,625 lb. of cotton ?

5. How many loads of 1250 bricks each are there in a pile containing 80,000 bricks ?

6. There are 1760 yards in a mile. How many miles are there in 147,840 yd. ?

7. If a shingle machine manufactures 5079 shingles in 1 day, how many days will be required to manufacture 1,589,727 shingles ?

8. If $ 9450 are paid for 75 acres of land, find the cost of 1 acre.

9. A man traveled 26,605 miles in 313 days. How far, on the average, did he travel each day ?

10. When $ 22,610 are paid for 238 acres of land, how much is paid for 1 acre ?

11. If 3125 square feet of land cost $ 750.00, how much is that a square foot ?

1. A cattle dealer paid $ 24,108 for 574 head of cattle. Find the average price per head.

2. The cost of building 358 miles of railroad was $ 2,509,938. How much was that a mile?

3. The weight of 136 tons of coal is 304,640 pounds. Find the number of pounds in 1 ton.

4. There are 924,000 feet in 175 miles. Find how many feet 1 mile contains.

5. A company divided $ 494,000 equally among 6175 stockholders. Find the share of each.

6. If a nail factory turns out 87,640 kegs of nails in 313 days, how many kegs is that a day?

7. When $ 8778 are paid for 462 tons of hay, how much is paid for 1 ton?

8. At 6¢ a qt., how many quarts of milk can be bought for $ 144?

9. At 9¢ a gal., how many gallons of coal oil will $ 207 buy?

10. How many yards of muslin at 8¢ a yard can be bought for $ 1200?

11. A dealer bought 1600 bushels of potatoes at $ .35 a bushel. He sold $\frac{1}{2}$ of them at $ .40 a bushel, and the remainder at $ .32. Did he gain or lose, and how much?

1. A speculator invested $700 in coffee at 28¢ a pound. How many pounds did he get?

2. How many bushels of oats at 35¢ a bushel can be bought for $7140?

3. How many pounds of tobacco at 75¢ a pound can be bought for $600?

4. When corn is selling at 70¢ a bushel, how many bushels can be bought for $35,140?

5. If a man invested $1230 in potatoes at 60¢ a bushel how many bushels did he get?

6. If 450 pounds of tea cost $382.50, find the cost of 1 pound.

7. At 18¢ each, how many watermelons can you buy for $62.10?

8. A drover paid $2998.80 for 72 head of cattle. What was the cost per head?

9. A merchant paid $210 for cheese at 12¢ a pound. How many pounds did he get?

10. How many quarts of berries at 8¢ a quart must a man sell to get $123.20?

11. The sum of two numbers is 8964, and 5369 is 125 more than the larger number. Find the numbers.

12. $33.30 ÷ 18 = $48.10 ÷ $1.85 =

1. If 16 yards of cloth cost $48.64, how much will 35 yards cost?

OPERATION

$48.64 ÷ 16 = $3.04, cost of 1 yard.

$3.04 × 35 = $106.40, cost of 35 yards.

2. Find the cost of 41 tons of hay when 21 tons cost $308.70.

3. When $46.25 are paid for 37 barrels of potatoes, how much must be paid for 56 barrels?

4. When $30.24 are paid for 72 cans of peaches, how much must be paid for 144 cans?

5. What is the cost of 95 acres of land if 24 acres cost $1800?

6. How much will 145 cases of rubber shoes cost if 39 cases cost $477.75?

7. When 18 cases of shoes cost $656.10, how many cases can be bought for $1312.20?

OPERATION

$656.10 ÷ 18 = $36.45, cost of 1 case.

$1312.20 ÷ $36.45 = 36, no. of cases.

NOTE. — When both dividend and divisor contain dollars and cents, change both to cents and divide as in simple whole numbers. Thus, $12.75 ÷ $4.25 = 1275¢ ÷ 425¢ = 3.

1. A carpenter earned $61.10 in 26 days. At the same rate per day, how long would it take him to earn $183.30?

2. If I pay $73.50 for 14 barrels of mackerel, how many barrels can I purchase for $367.50?

3. How many cows can be bought for $8599.50, at the rate of 63 cows for $2866.50?

4. A farmer paid $17330.50 for 137 acres of timber land. At the same rate, how many acres could be bought for $34661?

5. A tailor bought 5 pieces of cloth, each piece containing 30 yd., at $4 a yard. How many suits of clothes, at $20 each, must he sell to pay for the pieces of cloth?

6. A farmer raised 3076 bu. of corn. He kept ¼ of it and sold the remainder at 73¢ a bushel. How much did he receive for what he sold?

7. A man paid $1704 for wagons, giving $35½ apiece. How many did he buy?

8. If a man buys 12,465 bu. of oats at 28¢ a bushel, for how much must he sell it per bushel to gain $623.25?

9. If my bill for 4 dozen chairs is $204, what will be the bill for 15 chairs of the same kind?

1. Willie sold, in one year, 6324 newspapers, which was 4 times as many as his brother John sold. How much more money did Willie receive than his brother, if they sold their papers at 3 ¢ apiece?

2. A flour dealer bought 140 barrels of flour at $ 6 a barrel. If 20 barrels were damaged, for how much per barrel must he sell the remainder that he may neither gain nor lose by the transaction?

3. If a man bought 560 tons of coal, at $ 6 a ton, and sold it at a loss of $ 1120, how much per ton did he receive for it?

4. I bought 120 bu. of wheat at the rate of 12 bu. for $ 10.56, and sold it at the rate of 9 bu. for $ 7.83. Find the loss.

5. Mr. Miller bought 532 bbl. of apples at $ 3.20 a barrel, and sold them for $ 2181.20. How much did he gain on each barrel?

6. A passenger train ran 368 miles in 8 hours. If its rate of running is increased 2 miles an hour, in how many hours will it run 1152 miles?

7. A man sold hay for $ 2845 and lost $ 228.45. How much would he have received for it, if he had gained $ 197.60?

8. How many bushels of wheat can be bought for $ 74.80 at the rate of 7 bu. for $ 5.95?

1. Two brothers, James and John, start from the same point and travel in opposite directions. If James travels·east at the rate of 65 rd. in 5 minutes, and John travels west at the rate of 70 rd. in 5 minutes, how many rods will they be apart in 1 hour?

2. I bought 145 barrels of onions for $340.75. If I sell them at a gain of 30¢ per barrel, how much per barrel do I receive for them?

3. William Wilson bought sheep for $114. If he sells 1 more than half of them for cost, he will receive for them $61.75. How many did he buy?

4. A bricklayer received $29.25 for a certain number of days' work. Had he worked two days more, he would have received $35.75. How many days did he work?

5. How many barrels of flour worth $4.25 a barrel, must be sold to pay for 75 bushels of wheat worth 85¢ a bushel?

6. $(105056 \div 56) \times 8 = 8 + ?$

7. $(601344 \div 192) \div 12 = 963 - ?$

8. At $6.80 a cwt., how many pounds of beef can be bought for $163.20?

9. How many pounds of sugar at 6¢ a pound can be exchanged for 9 lb. of butter at 32¢ a pound and 12 doz. eggs at 18¢ a dozen?
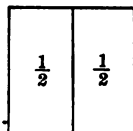
1. If a melon is divided into two *equal* pieces, what part of a melon will each piece be?

2. How many halves are there in a melon? in a square? in a circle?

3. How many halves are there in 1 apple? in $1\frac{1}{2}$ apples? in 2 apples? in $2\frac{1}{2}$ oranges? in 3 inches? in $5\frac{1}{2}$ inches?

4. How many halves are there in *anything?*

5. How many half-melons make one melon? 2 melons? $2\frac{1}{2}$ melons?

6. How many half-squares make 1 square? 3 squares? $5\frac{1}{2}$ squares?

7. How many half-circles make 1 circle? 4 circles? $7\frac{1}{2}$ circles?

8. How many halves of *anything* make *one?*

9. How many oranges are there in 2 half-oranges? 3 half-oranges? 4 half-oranges?

10. What is $\frac{1}{2}$ of 1? 2? 3? 4? 5? 6? 7? 9?

11. How many 1's are there in 2 halves ($\frac{2}{2}$)? in 3 halves ($\frac{3}{2}$)? in 4 halves ($\frac{4}{2}$)? in 5 halves ($\frac{5}{2}$)? in 9 halves ($\frac{9}{2}$)?

12. How many dollars are there in 9 half-dollars?

WRITTEN WORK
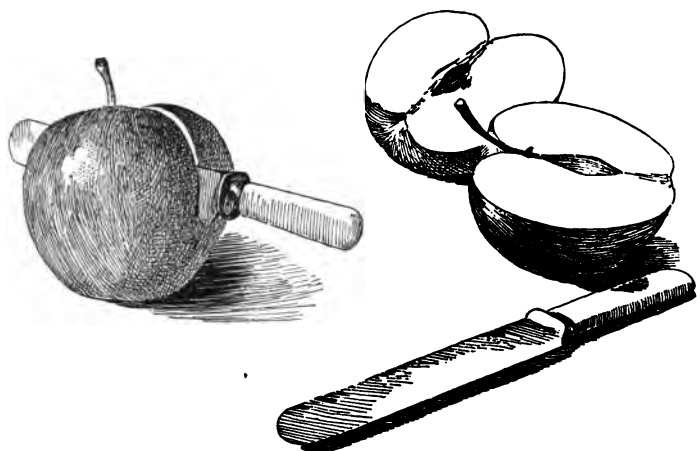
1. $\frac{1}{2}$ of an apple $+ \frac{1}{2}$ of an apple $=$ $\frac{1}{2} + \frac{1}{2} =$

2. 2 times $\frac{1}{2}$ of an apple $=$ $2 \times \frac{1}{2} =$

3. 1 apple $- \frac{1}{2}$ of an apple $=$ $1 - \frac{1}{2} =$

4. 1 apple $+ \frac{1}{2}$ of an apple $=$ $1 + \frac{1}{2} =$

5. $1\frac{1}{2}$ apples $- \frac{1}{2}$ of an apple $=$ $1\frac{1}{2} - \frac{1}{2} =$

6. $1\frac{1}{2}$ apples $+ \frac{1}{2}$ of an apple $=$ $1\frac{1}{2} + \frac{1}{2} =$

7. 1 apple contains $\frac{1}{2}$ of an apple — times. $1 \div \frac{1}{2} =$

8. $1\frac{1}{2}$ apples contain $\frac{1}{2}$ of an apple — times. $1\frac{1}{2} \div \frac{1}{2} =$

9. 2 apples contain $\frac{1}{2}$ of an apple — times. $2 \div \frac{1}{2} =$

10. $2\frac{1}{2}$ apples contain $\frac{1}{2}$ of an apple — times. $2\frac{1}{2} \div \frac{1}{2} =$

I. ORAL WORK

	a.	b.	c.	d.
1.	$\frac{1}{2}+\frac{1}{2}=$	$2\frac{1}{2}-1\frac{1}{2}=$	$5-3\frac{1}{2}=$	$10\frac{1}{2}+9\frac{1}{2}=$
2.	$1-\frac{1}{2}=$	$3-\frac{1}{2}=$	$7+5\frac{1}{2}=$	$12-9\frac{1}{2}=$
3.	$1\frac{1}{2}+\frac{1}{2}=$	$4-\frac{1}{2}=$	$6\frac{1}{2}+4\frac{1}{2}=$	$17-8\frac{1}{2}=$
4.	$2-\frac{1}{2}=$	$7+1\frac{1}{2}=$	$7\frac{1}{2}-5=$	$14\frac{1}{2}-11\frac{1}{2}=$
5.	$2+\frac{1}{2}=$	$8\frac{1}{2}-2\frac{1}{2}=$	$8-3\frac{1}{2}=$	$9\frac{1}{2}+7\frac{1}{2}=$

II. WRITTEN WORK

Add:

1.	2.	3.	4.	5.	6.	7.
$17\frac{1}{2}$	$15\frac{1}{2}$	$21\frac{1}{2}$	28	$18\frac{1}{2}$	$25\frac{1}{2}$	$29\frac{1}{2}$
19	$25\frac{1}{2}$	23	$13\frac{1}{2}$	$13\frac{1}{2}$	$18\frac{1}{2}$	$71\frac{1}{2}$
$12\frac{1}{2}$	24	$19\frac{1}{2}$	$18\frac{1}{2}$	$22\frac{1}{2}$	$46\frac{1}{2}$	$49\frac{1}{2}$

Subtract:

8.	9.	10.	11.	12.	13.	14.
$16\frac{1}{2}$	$25\frac{1}{2}$	36	29	$19\frac{1}{2}$	43	62
13	$15\frac{1}{2}$	$27\frac{1}{2}$	$16\frac{1}{2}$	$12\frac{1}{2}$	$27\frac{1}{2}$	$14\frac{1}{2}$

III. WRITTEN WORK

	a.	b.
1.	$28\frac{1}{2}+13\frac{1}{2}-29=$	$18\frac{1}{2}-12+16\frac{1}{2}+14\frac{1}{2}=$
2.	$36+24\frac{1}{2}-38=$	$28\frac{1}{2}+32\frac{1}{2}+46-24\frac{1}{2}=$
3.	$84\frac{1}{2}-17\frac{1}{2}-13\frac{1}{2}=$	$23+121\frac{1}{2}-62\frac{1}{2}-37\frac{1}{2}=$
4.	$25\frac{1}{2}+37\frac{1}{2}+16\frac{1}{2}=$	$162-33\frac{1}{2}-29\frac{1}{2}+46\frac{1}{2}=$

1. Mary bought 3 yd. of silk at one store and $5\frac{1}{2}$ yd. at another. How many yards did she buy?

2. A boy picked 10 qt. of berries and sold $3\frac{1}{2}$ qt. How many quarts were left?

3. A lady bought two remnants of calico. One contained $4\frac{1}{2}$ yd., and the other $7\frac{1}{2}$ yd. How many yards were there in both pieces?

a.	*b.*
1. $\frac{1}{2}$ of a yard = — ft.	$\frac{1}{2}$ of a ton = — lb.
2. $\frac{1}{2}$ of a day = — hr.	$\frac{1}{2}$ of a yard = — in.
3. $\frac{1}{2}$ of a bushel = — pk.	$\frac{1}{2}$ of a foot = — in.
4. $\frac{1}{2}$ of a ton = — cwt.	$\frac{1}{2}$ of a gross = — doz.

	a.	*b.*	*c.*	*d.*
1.	$2 \times \frac{1}{2} =$	$2 \div \frac{1}{2} =$	$8 \times \frac{1}{2} =$	$6 \div \frac{1}{2} =$
2.	$\frac{2}{2} \div \frac{1}{2} =$	$5 \times \frac{1}{2} =$	$4 \div \frac{1}{2} =$	$6 \times 1\frac{1}{2} =$
3.	$1 \div \frac{1}{2} =$	$2\frac{1}{2} \div \frac{1}{2} =$	$9 \times \frac{1}{2} =$	$9 \div 1\frac{1}{2} =$
4.	$3 \times \frac{1}{2} =$	$6 \times \frac{1}{2} =$	$4\frac{1}{2} \div \frac{1}{2} =$	$4 \times 2\frac{1}{2} =$
5.	$\frac{3}{2} \div \frac{1}{2} =$	$3 \div \frac{1}{2} =$	$4 \times 1\frac{1}{2} =$	$10 \div 2\frac{1}{2} =$
6.	$4 \times \frac{1}{2} =$	$7 \times \frac{1}{2} =$	$6 \div 1\frac{1}{2} =$	$20 \div 2\frac{1}{2} =$
7.	$\frac{4}{2} \div \frac{1}{2} =$	$3\frac{1}{2} \div \frac{1}{2} =$	$5 \times 1\frac{1}{2} =$	$7 \times 8\frac{1}{2} =$

I. WRITTEN WORK

a.	b.	c.	d.
1. $7 \times 3\frac{1}{2} =$	$7 \times 14\frac{1}{2} =$	$29 \div \frac{1}{2} =$	$5 \times ? = 2\frac{1}{2}$
2. $12\frac{1}{2} \div \frac{1}{2} =$	$8\frac{1}{2} \times 2 =$	$38\frac{1}{2} \div \frac{1}{2} =$	$8\frac{1}{2} \times ? = 17$
3. $13 \div \frac{1}{2} =$	$31 \div \frac{1}{2} =$	$39 \div \frac{1}{2} =$	$? \div \frac{1}{2} = 15$
4. $2 \times 24\frac{1}{2} =$	$35\frac{1}{2} \div \frac{1}{2} =$	$46 \times 3\frac{1}{2} =$	$? \div \frac{1}{2} = 31$
5. $15\frac{1}{2} \div \frac{1}{2} =$	$29 \times 1\frac{1}{2} =$	$28\frac{1}{2} \times 7 =$	$7 \times ? = 3\frac{1}{2}$
6. $25\frac{1}{2} \div \frac{1}{2} =$	$14\frac{1}{2} \times 2 =$	$49\frac{1}{2} \div \frac{1}{2} =$	$? \div \frac{1}{2} = 54$

II. ORAL WORK

1. How much will 1 dozen marbles cost at $\frac{1}{2}$ a cent apiece?

2. At $\frac{1}{2}$ a cent each, how many boxes of matches can be bought for 5¢? 8¢? 17¢? 21¢?

3. At $8\frac{1}{2}$¢ a pint, how much will 1 quart of cream cost?

4. At $\frac{1}{2}$ a cent each, how many plums can be bought for 10¢? 12¢? 14¢?

5. At $1\frac{1}{2}$¢ each, how much will 8 eggs cost?

6. What is $\frac{1}{2}$ of 11? 13? 15? 17? 19? 21? 23? 25?

7. How many 1's are there in $\frac{10}{2}$? $\frac{13}{2}$? $\frac{19}{2}$? $\frac{21}{2}$? $\frac{24}{2}$? $\frac{27}{2}$? $\frac{29}{2}$?

8. If 15¢ is $\frac{1}{2}$ of what John paid for a ball, how much did he pay for it?

9. How many times is $\frac{1}{2}$ contained in 9? in $12\frac{1}{2}$? in $17\frac{1}{2}$?

1. How many half-pint bottles will a gallon of cider fill?

2. At $5\frac{1}{2}$¢ a lb., how much will 18 lb. sugar cost?

3. At $12\frac{1}{2}$¢ a gal., how much will 22 gal. oil cost?

4. A man raised 38 bu. of potatoes, and sold all but $12\frac{1}{2}$ bu. How many bushels did he sell?

5. At $40\frac{1}{2}$¢ a peck, how much will 3 pecks of pears cost? $4\frac{1}{2}$ bu.?

6. From a bin of wheat containing 48 bu. there were sold at one time $16\frac{1}{2}$ bu., and at another time 19 bu. How much is the remainder worth at 80¢ a bu.?

7. At $\frac{1}{2}$ of a cent apiece, how many pins can you buy for 28¢? 45¢? 70¢? 90¢?

II. WRITTEN WORK

Add:

1.	2.	3.
$\$\,28\frac{1}{2}$	$\$\,37.12\frac{1}{2}$	$\$\,135.62\frac{1}{2}$
$17\frac{1}{2}$	15.22	$164.06\frac{1}{2}$
126	$18.37\frac{1}{2}$	$72.36\frac{1}{2}$
$92\frac{1}{2}$	19.45	56.72
$54\frac{1}{2}$	$37.38\frac{1}{2}$	84.91
$79\frac{1}{2}$	$92.62\frac{1}{2}$	$76.87\frac{1}{2}$
84	74.25	9.37
$\$$	$\$$	$\$$

1. A barrel of plaster, including the barrel, weighs 295 lb. What is the weight of the plaster, if the barrel weighs $20\frac{1}{2}$ lb. ?

2. Find the cost of 24 lb. of cheese at the rate of 2 lb. for 25 ¢.

3. A lady bought 12 yd. of linen one day, and $17\frac{1}{2}$ yd. the next day. Find the cost at 24 ¢ a yard.

4. A dealer bought 120 sheep. He sold $\frac{1}{2}$ of them at $\$3\frac{1}{2}$ apiece, and the remainder at $\$2\frac{1}{2}$ apiece. How much did he receive for them ?

5. At $\$\frac{1}{2}$ a pound, how many pounds of tea can be bought for $\$17\frac{1}{2}$?

6. If you put up 50 lb. of baking powder into $\frac{1}{2}$-pound packages, how many packages will you have?

7. $\$12\frac{1}{2} + \$21 - \$17\frac{1}{2} =$

8. $\$16\frac{1}{2} \times 4, - \$28\frac{1}{2} =$

9. $\$24 \div \frac{1}{2}, + \$45\frac{1}{2} =$

10. $\$90 - \$17\frac{1}{2} + \$39 =$

11. 72 lb. $\div \frac{1}{2}, + 30\frac{1}{2}$ lb. $=$

12. $79\frac{1}{2}$ yd. $\times 5, - 16$ yd. $=$

13. 84 in. $\div \frac{1}{2}, - 75\frac{1}{2}$ in. $=$

14. 15 hr. $\times 5\frac{1}{2}, + 14$ hr. $=$

15. 92 pk. $- ? = 17\frac{1}{2}$ pk.

16. $50\frac{1}{2}¢ \div \frac{1}{2}, - 1¢ =$

1. If an orange is divided into four equal parts, what is each part called?

2. How many fourths are there in $\frac{1}{2}$ of an orange?

3. How many fourths are there in $1\frac{1}{2}$ oranges?

4. How many fourths are there in $1\frac{3}{4}$ oranges?

5. How many fourths are there in 2 oranges?

6. How many fourths are there in $2\frac{1}{2}$ oranges?

7. How many oranges are there in 5 fourths of an orange?

8. How many oranges are there in 6 fourths of an orange?

9. How many oranges are there in 8 fourths of an orange?

10. How many apples are there in 10 fourths of an apple?

11. How many melons are there in 12 fourths of a melon? in 8 fourths?

12. Show by a drawing that 3 squares contain 12 fourths of a square.

(Get answers from the above diagram)

a.	b.
1. $\frac{1}{4}+\frac{1}{4}=$ how many fourths?	How much is $1-\frac{1}{4}$?
2. $\frac{2}{4}+\frac{1}{4}=$ how many fourths?	How much is $1-\frac{2}{4}$?
3. $\frac{3}{4}+\frac{1}{4}=$ how many fourths?	How much is $1-\frac{3}{4}$?
4. $\frac{1}{2}+\frac{1}{4}=$ how many fourths?	How much is $\frac{1}{2}-\frac{1}{4}$?
5. $\frac{1}{2}+\frac{2}{4}=$ how many fourths?	How much is $\frac{3}{4}-\frac{1}{4}$?
6. $\frac{1}{2}+\frac{3}{4}=$ how many fourths?	How much is $\frac{3}{4}-\frac{1}{2}$?

1. How much more is $\frac{1}{2}$ than $\frac{1}{4}$? How much more is $\frac{3}{4}$ than $\frac{1}{2}$?

2. How many fourths are there in $1\frac{1}{2}$? in 2? in $3\frac{1}{2}$?

3. How many halves are there in $\frac{2}{4}$? in $\frac{4}{4}$? in $\frac{8}{4}$?

4. $\frac{1}{2}$ of $\frac{1}{2}$ equals how many fourths? $\frac{1}{2}$ of $\frac{2}{4}=$ how many fourths?

5. How many times is $\frac{1}{4}$ contained in 1? in $1\frac{1}{4}$? in 2? in $2\frac{1}{2}$?

1. A whole melon can be divided into how many halves? into how many fourths? into how many eighths?

2. $\frac{1}{4}$ of a melon equals how many eighths?

3. $\frac{1}{2}$ of a melon equals how many eighths?

4. $\frac{1}{2}$ of a melon $+\frac{1}{4}$ of a melon equal how many eighths?

5. $\frac{1}{2}$ of a melon $-\frac{1}{8}$ of a melon equals how many eighths?

6. $\frac{3}{4}$ of a melon $-\frac{3}{8}$ of a melon equals how many eighths?

a.	b.	c.
1. $\frac{1}{8}+\frac{1}{8}=\frac{}{8}$	$2\times\frac{1}{8}=\frac{}{8}$	$\frac{1}{2}+\frac{1}{4}=\frac{}{8}$
2. $\frac{2}{8}+\frac{1}{8}=\frac{}{8}$	$5\times\frac{1}{8}=\frac{}{8}$	$\frac{3}{4}+\frac{1}{8}=\frac{}{8}$
3. $\frac{5}{8}+\frac{2}{8}=\frac{}{8}$	$\frac{1}{4}+\frac{1}{8}=\frac{}{8}$	$\frac{1}{4}+\frac{5}{8}=\frac{}{8}$
4. $1-\frac{1}{8}=\frac{}{8}$	$\frac{1}{4}+\frac{3}{8}=\frac{}{8}$	$\frac{1}{2}$ of $\frac{1}{4}=\frac{}{8}$
5. $\frac{7}{8}-\frac{1}{8}=\frac{}{8}$	$\frac{1}{2}+\frac{1}{8}=\frac{}{8}$	$\frac{1}{2}$ of $\frac{2}{8}=\frac{}{8}$

1. How much more is $\frac{1}{4}$ than $\frac{1}{8}$? $\frac{3}{8}$ than $\frac{1}{4}$?

2. How many eighths equal $1\frac{1}{8}$? $1\frac{5}{8}$? $1\frac{1}{4}$? $2\frac{3}{4}$?

3. How many fourths equal $\frac{2}{8}$? $\frac{4}{8}$? $\frac{6}{8}$? $\frac{8}{8}$?

4. What is $\frac{1}{2}$ of $\frac{4}{8}$? of $\frac{6}{8}$? of $\frac{8}{8}$?

5. How many times is $\frac{1}{8}$ contained in 1? $1 \div \frac{1}{8} = ?$

6. How many times is $\frac{1}{8}$ contained in $1\frac{1}{8}$? $1\frac{1}{8} \div \frac{1}{8} = ?$

7. How many times is $\frac{1}{8}$ contained in $1\frac{5}{8}$? $1\frac{5}{8} \div \frac{1}{8} = ?$

8. How many times is $\frac{1}{8}$ contained in 2? $2 \div \frac{1}{8} = ?$

9. How many times is $\frac{1}{8}$ contained in $\frac{5}{8}$? $\frac{5}{8} \div \frac{1}{8} = ?$

Numbers which consist of a whole number and a fraction, as $5\frac{3}{4}$, $4\frac{2}{9}$, and $7\frac{3}{5}$, are called **Mixed Numbers.**

1. Change to whole or mixed numbers: $\frac{7}{2}$; $\frac{8}{2}$; $\frac{9}{2}$; $\frac{11}{2}$; $\frac{12}{2}$; $\frac{15}{2}$; $\frac{17}{2}$; $\frac{20}{2}$; $\frac{21}{2}$.

2. How many halves are there in $2\frac{1}{2}$? in $5\frac{1}{2}$?

3. How many times is $\frac{1}{4}$ contained in $\frac{3}{4}$? $\frac{3}{4} \div \frac{1}{4} = ?$

4. How many times is $\frac{1}{4}$ contained in $1\frac{3}{4}$? $1\frac{3}{4} \div \frac{1}{4} = ?$

5. How many times is $\frac{1}{4}$ contained in $\frac{1}{2}$? $\frac{1}{2} \div \frac{1}{4} = ?$

6. How many times is $\frac{1}{8}$ contained in $\frac{1}{2}$? $\frac{1}{2} \div \frac{1}{8} = ?$

7. How many times is $\frac{1}{8}$ contained in $\frac{1}{4}$? $\frac{1}{4} \div \frac{1}{8} = ?$

I. ORAL WORK

	a.	*b.*	*c.*	*d.*
1.	$\frac{1}{4}+\frac{1}{4}=$	$1 \ -\frac{1}{4}=$	$1\frac{3}{4}+\frac{1}{4}=$	$8\frac{1}{2}-5 \ =$
2.	$\frac{2}{4}-\frac{1}{4}=$	$1 \ +\frac{1}{4}=$	$2 \ -\frac{1}{4}=$	$8\frac{3}{4}-4\frac{1}{2}=$
3.	$\frac{2}{4}+\frac{1}{4}=$	$1\frac{1}{4}-\frac{1}{4}=$	$2\frac{1}{2}+\frac{1}{4}=$	$9 \ -3\frac{3}{4}=$
4.	$\frac{3}{4}-\frac{1}{4}=$	$1\frac{1}{2}+\frac{1}{4}=$	$2\frac{3}{4}-\frac{1}{2}=$	$7 \ +2\frac{1}{4}=$
5.	$\frac{3}{4}+\frac{1}{4}=$	$1\frac{3}{4}-\frac{1}{2}=$	$4 \ -\frac{3}{4}=$	$8\frac{1}{2}+2\frac{1}{4}=$

II. ORAL WORK

	a.	*b.*	*c.*	*d.*
1.	$\frac{1}{8}+\frac{1}{8}=$	$1 \ - \ \frac{1}{8}=$	$\frac{1}{2}+\frac{1}{8}=$	$2\frac{1}{2}+3\frac{1}{8}=$
2.	$\frac{2}{8}-\frac{1}{8}=$	$1 \ - \ \frac{3}{8}=$	$\frac{1}{2}-\frac{1}{8}=$	$3\frac{1}{4}+2\frac{1}{8}=$
3.	$\frac{5}{8}-\frac{2}{8}=$	$1\frac{5}{8}- \ \frac{3}{8}=$	$\frac{1}{4}+\frac{1}{8}=$	$7\frac{1}{4}-5\frac{1}{8}=$
4.	$\frac{4}{8}+\frac{3}{8}=$	$4\frac{3}{8}-2\frac{1}{4}=$	$\frac{1}{4}-\frac{1}{8}=$	$8\frac{1}{2}-3\frac{3}{8}=$
5.	$\frac{7}{8}-\frac{5}{8}=$	$7 \ -1\frac{1}{8}=$	$\frac{3}{4}-\frac{5}{8}=$	$7\frac{5}{8}-3\frac{1}{2}=$

III. WRITTEN WORK

Add:

	1.	**2.**	**3.**	**4.**	**5.**
	$12\frac{1}{4}=12\frac{2}{8}$	$17\frac{1}{4}$	$28\frac{1}{8}$	$28\frac{1}{2}$	$72\frac{3}{4}$
	$16\frac{1}{8}=16\frac{1}{8}$	$23\frac{1}{4}$	$36\frac{4}{8}$	$19\frac{1}{4}$	$28\frac{1}{8}$
	$Ans.=28\frac{3}{8}$				

	6.	**7.**	**8.**	**9.**	**10.**	**11.**
	$81\frac{1}{2}$	$21\frac{1}{8}$	$24\frac{1}{4}$	$28\frac{1}{2}$	$42\frac{1}{2}$	$74\frac{1}{2}$
	20	$41\frac{1}{8}$	$25\frac{1}{2}$	$15\frac{3}{8}$	$28\frac{1}{4}$	$25\frac{1}{2}$
	$16\frac{1}{4}$	24	$16\frac{1}{8}$	17	$18\frac{1}{8}$	$16\frac{1}{8}$

I. WRITTEN WORK

Subtract:

1.	2.	3.	4.	5.	6.
$56\frac{1}{4}$	$72\frac{3}{4}$	$80\frac{1}{2}$	$37 = 36\frac{4}{4}$	84	$92\frac{3}{8}$
$23\frac{1}{4}$	$21\frac{1}{4}$	29	$18\frac{1}{4} = 18\frac{1}{4}$	$27\frac{3}{4}$	$27\frac{1}{8}$
			$Ans. = 18\frac{3}{4}$		

7.	8.	9.	10.	11.
$67\frac{5}{8}$	$65\frac{1}{2} = 65\frac{4}{8}$	$46\frac{1}{4}$	$69\frac{3}{4}$	72
$49\frac{3}{8}$	$27\frac{3}{8} = 27\frac{3}{8}$	$29\frac{1}{8}$	$42\frac{5}{8}$	$35\frac{7}{8}$
	$Ans. = 38\frac{1}{8}$			

II. WRITTEN WORK

	a.	*b.*
1.	$12\frac{1}{2} + 14\frac{1}{4} - 12\frac{3}{4} =$	$46\frac{1}{4} + 24\frac{3}{4} - 38\frac{7}{8} =$
2.	$16\frac{1}{4} + 21\frac{1}{8} - 13 \;\; =$	$29\frac{1}{2} - 14\frac{1}{4} + 29\frac{3}{8} =$
3.	$81\frac{1}{8} - 46\frac{1}{8} + 32\frac{1}{4} =$	$17\frac{1}{4} + 22\frac{1}{2} - 18\frac{5}{8} =$
4.	$25\frac{3}{4} + 18\frac{1}{4} - 39\frac{3}{8} =$	$46\frac{1}{4} - 12\frac{1}{8} + 25\frac{1}{8} =$
5.	$36\frac{1}{2} - 24\frac{1}{2} + 42\frac{3}{4} =$	$29\frac{5}{8} + 36\frac{1}{2} - 39\frac{3}{8} =$

III. WRITTEN WORK

	a.	*b.*
1.	$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{3}{4} + \frac{3}{8} =$	$\frac{1}{2} + \frac{3}{4} - \frac{1}{8} - \frac{5}{8} + \frac{1}{4} - \frac{5}{8} =$
2.	$\frac{3}{4} + \frac{1}{8} + \frac{1}{2} + \frac{1}{4} + \frac{5}{8} =$	$\frac{1}{4} + \frac{1}{2} + \frac{1}{8} - \frac{1}{2} + \frac{1}{4} - \frac{1}{2} =$
3.	$\frac{3}{4} - \frac{1}{4} + \frac{1}{2} - \frac{3}{8} + \frac{1}{4} =$	$\frac{3}{4} - \frac{1}{2} + \frac{5}{8} - \frac{3}{4} + \frac{1}{2} - \frac{1}{4} =$
4.	$\frac{1}{8} + 1 + \frac{1}{4} - \frac{1}{2} - \frac{3}{8} =$	$1 - \frac{5}{8} + \frac{1}{2} - \frac{3}{4} + \frac{1}{4} + 1 =$
5.	$\frac{7}{8} + \frac{3}{4} - 1 + \frac{3}{8} - 1 =$	$\frac{7}{8} - \frac{1}{2} + \frac{1}{4} - \frac{3}{8} + \frac{1}{2} - \frac{5}{8} =$

I. ORAL WORK

How many 1's are there in :   How many fourths are there in :

a.	b.	c.	d.
1. $\frac{8}{4}$?	$\frac{9}{2}$?	$5\frac{1}{4}$?	$8\frac{3}{4}$?
2. $\frac{12}{4}$?	$\frac{16}{8}$?	$4\frac{4}{8}$?	$5\frac{6}{8}$?
3. $\frac{13}{4}$?	$\frac{16}{4}$?	$9\frac{1}{4}$?	$3\frac{2}{8}$?

II. ORAL WORK

1. A boy paid $\$\frac{1}{2}$ for apples and $\$\frac{1}{4}$ for pears. How much did he pay for both ?

2. A man bought $\frac{1}{2}$ a bushel of chestnuts and sold $\frac{1}{4}$ of a bushel. What part of a bushel had he left ?

3. A farmer owned 2 acres of land, and sold his son $\frac{3}{4}$ of an acre. How much had he left ?

4. If $\frac{1}{2}$ a pound of raisins costs 8¢, how much will 1 pound cost ?

5. A boy earned $\$\frac{1}{2}$ on Monday, and $\$\frac{1}{4}$ on Tuesday. How much did he earn in both days ?

6. A girl learned her lesson in arithmetic in $\frac{3}{4}$ of an hour, and her lesson in grammar in $\frac{1}{2}$ of an hour. How long did it take her to learn both ?

7. A lady paid $\$\frac{3}{4}$ for ribbon and $\$\frac{1}{2}$ for lace. How much did she pay for both ?

1. A man worked $42\frac{1}{2}$ hours one week, and $56\frac{3}{4}$ hours the next week. How many hours did he work in all?

2. If $18\frac{3}{4}$ yards of cloth are cut from a piece containing 45 yards, how many yards are left?

3. I paid $\$35\frac{1}{2}$ for a suit of clothes, and $\$4\frac{1}{4}$ for a hat. How much did I pay for both?

4. A lady bought $\frac{1}{8}$ of a yard of ribbon, $\frac{3}{4}$ of a yard of lace, and $\frac{1}{2}$ of a yard of tape. How many yards did she buy?

5. A man traveled on his bicycle $64\frac{3}{4}$ miles one day, and $33\frac{5}{8}$ miles the next day. How many miles did he lack of traveling 100 miles?

6. A farmer raised $91\frac{1}{2}$ bushels of potatoes. He sold all but $27\frac{1}{4}$ bushels. How many bushels did he sell?

7. A grocer sold $26\frac{1}{2}$ gallons of molasses from a barrel containing 42 gallons. How many gallons were left?

8. A lady used $9\frac{3}{4}$ yards of silk for a skirt, and $4\frac{1}{8}$ yards for a waist. How many yards did she use for both?

9. Wilson earned $\$37\frac{3}{8}$ one week and $\$7\frac{1}{4}$ less the next week. How much did he earn both weeks?

I. ORAL WORK

	a.	b.	c.	d.
1.	$2 \times \frac{1}{4} =$	$3 \div \frac{1}{4} =$	$7\frac{3}{4} \div \frac{1}{4} =$	$2 \times \frac{1}{8} =$
2.	$\frac{2}{4} \div 2 =$	$4 \div \frac{1}{4} =$	$6 \times 1\frac{2}{4} =$	$\frac{2}{8} \div 2 =$
3.	$3 \times \frac{1}{4} =$	$4 \times 1\frac{1}{4} =$	$10 \div 1\frac{1}{4} =$	$8 \times \frac{1}{8} =$
4.	$\frac{3}{4} \div 3 =$	$5 \div 1\frac{1}{4} =$	$5 \times 4\frac{1}{4} =$	$\frac{8}{8} \div 8 =$
5.	$4 \times \frac{1}{4} =$	$3 \times 1\frac{1}{4} =$	$15\frac{3}{4} \div 5\frac{1}{4} =$	$1 \div 8 =$
6.	$\frac{4}{4} \div 4 =$	$3\frac{3}{4} \div 1\frac{1}{4} =$	$6 \times 8\frac{3}{4} =$	$1 \div \frac{1}{8} =$
7.	$1 \div \frac{1}{4} =$	$5 \times 1\frac{2}{4} =$	$9\frac{3}{4} \div 3\frac{1}{4} =$	$1\frac{1}{8} \div \frac{1}{8} =$
8.	$2 \div \frac{1}{4} =$	$7\frac{1}{4} \div \frac{1}{4} =$	$8\frac{1}{4} \times 8 =$	$1\frac{3}{8} \div \frac{1}{8} =$

II. ORAL WORK

	a.	b.	c.	d.
1.	$2 \times 1\frac{1}{8} =$	$3 \div \frac{1}{8} =$	$8 \times 1\frac{3}{8} =$	$\frac{1}{4}$ of $1 =$
2.	$2\frac{2}{8} \div 1\frac{1}{8} =$	$4 \div \frac{1}{8} =$	$1\frac{5}{8} \div \frac{1}{8} =$	$\frac{1}{8}$ of $1 =$
3.	$5 \times 1\frac{1}{8} =$	$7 \times 1\frac{1}{8} =$	$3\frac{3}{8} \div 1\frac{1}{8} =$	$\frac{1}{2}$ of $\frac{1}{4} =$
4.	$5\frac{5}{8} \div 1\frac{1}{8} =$	$6 \times 1\frac{1}{8} =$	$8\frac{1}{8} \times 8 =$	$\frac{1}{2}$ of $\frac{1}{8} =$
5.	$2 \div \frac{1}{8} =$	$\frac{5}{8} \div \frac{1}{8} =$	$\frac{1}{2}$ of $1 =$	$\frac{1}{2}$ of $\frac{1}{2} =$

III. ORAL WORK

	a.	b.	c.	d.
1.	$1 \div \frac{1}{4} =$	$1\frac{1}{2} \div \frac{1}{4} =$	$6 \times 3\frac{3}{8} =$	$\frac{3}{4} \div \frac{1}{8} =$
2.	$\frac{1}{2} \div \frac{1}{4} =$	$1\frac{1}{4} \div \frac{1}{8} =$	$5 \times 4\frac{5}{8} =$	$\frac{3}{4} \div \frac{3}{8} =$
3.	$1 \div \frac{1}{8} =$	$1\frac{1}{2} \div \frac{1}{8} =$	$8 \times 3\frac{7}{8} =$	$6 \times 1\frac{1}{8} =$
4.	$\frac{1}{2} \div \frac{1}{8} =$	$8\frac{1}{2} \div \frac{1}{2} =$	$7\frac{7}{8} \div 1\frac{1}{8} =$	$6\frac{3}{4} \div 1\frac{1}{8} =$
5.	$\frac{1}{4} \div \frac{1}{8} =$	$8\frac{1}{2} \div \frac{1}{4} =$	$2\frac{3}{4} \div \frac{1}{8} =$	$8 \times 3\frac{3}{8} =$

I. WRITTEN WORK

$5 \times 36\frac{1}{4} = ?$

MODEL. — $5 \times 36 = 180$; $5 \times \frac{1}{4} = \frac{5}{4} = 1\frac{1}{4}$; $180 + 1\frac{1}{4} = 181\frac{1}{4}$, *Ans.*

	a.	*b.*	*c.*	*d.*
1.	$4 \times 84\frac{3}{4} =$	$7 \times 86\frac{1}{8} =$	$6 \times 75\frac{7}{8} =$	$7 \times 59\frac{2}{3} =$
2.	$8 \times 49\frac{1}{4} =$	$6 \times 59\frac{3}{8} =$	$9 \times 28\frac{1}{2} =$	$9 \times 74\frac{1}{4} =$
3.	$8 \times 76\frac{3}{4} =$	$8 \times 78\frac{5}{8} =$	$7 \times 79\frac{5}{8} =$	$7 \times 93\frac{3}{8} =$

II. WRITTEN WORK

$21\frac{3}{4} \div \frac{1}{4} = ?$

MODEL. — $\frac{3}{4} \div \frac{1}{4} = 3$; $21 \div \frac{1}{4} = 84$; $84 + 3 = 87$, *Ans.*

	a.	*b.*	*c.*	*d.*
1.	$33\frac{3}{4} \div \frac{1}{4} =$	$59\frac{1}{2} \div \frac{1}{4} =$	$63\frac{7}{8} \div \frac{1}{8} =$	$59\frac{1}{2} \div \frac{1}{8} =$
2.	$46\frac{1}{4} \div \frac{1}{4} =$	$38\frac{1}{8} \div \frac{1}{8} =$	$56\frac{1}{4} \div \frac{1}{8} =$	$34\frac{1}{2} \div \frac{1}{8} =$
3.	$48\frac{1}{2} \div \frac{1}{4} =$	$47\frac{3}{8} \div \frac{1}{8} =$	$65\frac{1}{4} \div \frac{1}{8} =$	$67\frac{3}{4} \div \frac{1}{8} =$

III. WRITTEN WORK

1. At $\$ 28\frac{1}{4}$ each, how much will 5 cows cost?

2. At $\$ \frac{1}{4}$ a bushel, how many bushels of onions can you buy for $\$ 26$? for $\$ 33\frac{3}{4}$? for $\$ 45\frac{1}{2}$?

3. If $\frac{1}{4}$ of a yard of silk costs $\$ \frac{3}{4}$, how much will 1 yard cost? 12 yards? $16\frac{1}{2}$ yards?

4. At $\frac{3}{8}$ of a cent each, how much will 25 apples cost?

5. At $\$ \frac{3}{4}$ a bushel, how much will 16 bushels of wheat cost?

6. How many inches are there in $28\frac{3}{4}$ ft.? in $4\frac{1}{2}$ yd.?

I. WRITTEN WORK

$12\frac{3}{4}$ = how many fourths?

MODEL.—$1 = \frac{4}{4}$; $12 = 12 \times \frac{4}{4} = \frac{48}{4}$; $\frac{48}{4} + \frac{3}{4} = \frac{51}{4}$, *Ans.*

1. $16\frac{1}{4}$ = how many fourths? $29\frac{1}{8}$ = how many eighths?

2. $29\frac{3}{4}$ = how many fourths? $43\frac{3}{8}$ = how many eighths?

3. $86\frac{1}{2}$ = how many halves? $84\frac{7}{8}$ = how many eighths?

II. WRITTEN WORK

$12\frac{1}{4}$ = how many eighths?

MODEL.—$\frac{1}{4} = \frac{2}{8}$; $12 = \frac{96}{8}$; $\frac{96}{8} + \frac{2}{8} = \frac{98}{8}$, *Ans.*

1. $21\frac{1}{4}$ = how many eighths? $59\frac{1}{4}$?

2. $45\frac{3}{4}$ = how many eighths? $64\frac{3}{4}$?

3. $23\frac{1}{2}$ = how many eighths? $48\frac{1}{2}$?

4. $47\frac{1}{2}$ = how many eighths? $85\frac{1}{2}$?

III. ORAL WORK

1. How many halves are there in $\frac{2}{4}$? $\frac{4}{4}$? $\frac{8}{4}$? $\frac{16}{4}$? $\frac{20}{4}$? $\frac{24}{4}$? $\frac{32}{4}$?

2. How many halves are there in $\frac{4}{8}$? $\frac{8}{8}$? $\frac{16}{8}$? $\frac{24}{8}$? $\frac{32}{8}$? $\frac{40}{8}$? $\frac{48}{8}$?

3. How many 1's are there in $\frac{28}{2}$? $\frac{40}{2}$? $\frac{16}{4}$? $\frac{24}{4}$? $\frac{32}{4}$? $\frac{64}{4}$? $\frac{72}{4}$?

4. How many ounces are there in $7\frac{3}{8}$ pounds?

5. At $\$\frac{1}{8}$ each, how many collars can be bought for $\$\frac{1}{4}$? $\$\frac{1}{2}$? $\$1\frac{1}{4}$? $\$1\frac{1}{2}$? $\$2\frac{1}{2}$?

I. WRITTEN WORK

Find the amount of the following bills:

1.	2.
$7\frac{3}{4}$ lb. sugar at 6¢, $	7 cwt. flour at $\$2\frac{1}{2}$, $
$6\frac{1}{2}$ yd. linen at 65¢,	13 bu. wheat at $\$ \frac{3}{4}$,
$12\frac{1}{4}$ lb. coffee at 35¢,	9 bbl. flour at $\$4\frac{3}{8}$,
$17\frac{3}{8}$ lb. butter at 30¢,	7 tons hay at $\$9\frac{3}{4}$,
$21\frac{5}{8}$ lb. cheese at 14¢,	9 pr. shoes at $\$3\frac{1}{8}$,
$8\frac{3}{4}$ doz. eggs at 27¢, _____	13 hats at $\$2\frac{3}{4}$, _____
Amount, $	Amount, $

II. WRITTEN WORK

How many:

a.	b.
1. Halves are there in $39\frac{1}{2}$?	Ones are there in $\frac{162}{2}$?
2. Fourths are there in $16\frac{3}{4}$?	Ones are there in $\frac{252}{4}$?
3. Eighths are there in $86\frac{3}{8}$?	Ones are there in $\frac{192}{8}$?

4. At $\$4\frac{1}{2}$ a pair, how many pairs of shoes can be bought for $\$9$? for $\$18$? for $\$27$? for $\$36$?

5. At $\$\frac{1}{2}$ each, how many books can be bought for $\$17\frac{1}{2}$?

6. How many barrels of flour can you get for $\$17$, if 1 barrel costs $\$4\frac{1}{4}$?

7. How much will $8\frac{3}{8}$ barrels of flour cost at $\$8$ a barrel?

1. If a man can walk $3\frac{1}{4}$ miles in 1 hour, in how many hours can he walk $9\frac{3}{4}$ miles? 13 miles?

2. At $\$2\frac{3}{4}$ a barrel, how much will 12 barrels of apples cost?

Show by drawings:

3. That 1 contains $\frac{1}{2}$ two times.

4. That 1 contains $\frac{1}{4}$ four times.

5. That $\frac{1}{2}$ contains $\frac{1}{8}$ four times.

6. That $\frac{1}{2}$ of $\frac{1}{2} = \frac{1}{4}$.

7. That $\frac{1}{2}$ of $\frac{1}{4} = \frac{1}{8}$.

8. That $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{8} = 1$.

1. At $\$2\frac{3}{8}$ a ton, how much will 8 tons of coal cost?

2. What is the sum of $\$45\frac{1}{2}$, $\$67\frac{3}{4}$, and $\$37\frac{5}{8}$?

3. A grocer put $48\frac{3}{8}$ lb. of sugar into 3 equal packages. How much sugar was in each package?

4. There are $16\frac{1}{2}$ ft. in 1 rod. How many feet are there in 13 rd.? in 34 rd.?

5. A carpenter earns $\$2\frac{3}{4}$ a day. How much will he earn in a week? in 4 weeks?

6. How many pounds of butter at $\$\frac{1}{4}$ a pound can be bought for $\$7\frac{1}{2}$?

Add:

1.	2.	3.
\$ 18.36½	\$ 186.75¼	\$ 329.62½
9.42¼	143.79⅜	746.78¼
3.06½	246.62½	269.37⅝
29.64¾	179.33¾	467.46½
8.32⅜	32.75½	869.27¾
\$	\$	\$

4. \$ 136½ + \$ 324¾ − \$ 186⅛ = ?   \$ 189⅞ − \$ 27¾ + \$ 306¼ = ?

5. At \$ 3¾ a barrel, how much will 20 barrels of cider cost? 25 barrels?

6. There are 5280 feet in a mile. How many feet are there in ⅝ of a mile?

7. There are 320 rods in a mile. How many rods are there in ⅜ of a mile?

8. There are 5½ yards in a rod. How many yards are there in 30 rods?

9. How many rods are there in 11 yards? in 55 yards?

10. How many days will 2½ gallons of cream last a family if ½ of a pint is used each day?

11. At \$ ¼ a pair, how many pairs of cuffs can be bought for \$ 3¼?

1. If a pie is divided into three equal parts, what is one part called?

2. If a pie is divided into six equal parts, what is one part called?

3. $\frac{1}{3}$ of a pie is equal to how many sixths?

4. $\frac{1}{2}$ of a pie is equal to how many sixths?

5. $\frac{2}{3}$ of a pie is equal to how many sixths?

6. $\frac{1}{3}$ of a pie $+\frac{1}{6}$ of a pie $=$ how many sixths?

7. $\frac{2}{3}$ of a pie $+\frac{1}{6}$ of a pie $=$ how many sixths?

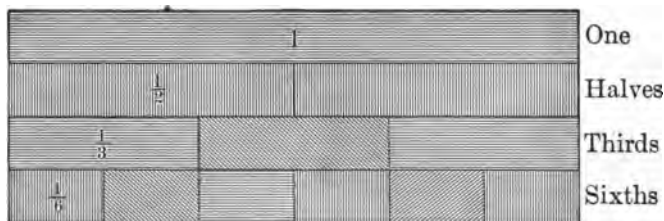8. How many thirds of a pie are there in $\frac{2}{6}$ of a pie? in $\frac{4}{6}$ of a pie?

9. A whole pie contains $\frac{2}{6}$ of a pie —— times.

10. A whole pie contains $\frac{3}{6}$ of a pie —— times.

11. 2 times $\frac{1}{3}$ of a pie $=$ how many thirds?

12. 5 times $\frac{1}{6}$ of a pie $=$ how many sixths?

(Get answers from the above diagram.)

a.	b.
1. How many thirds $= 1$?	$\frac{1}{3}+\frac{1}{6}=$ how many sixths?
2. How many sixths $= 1$?	$\frac{1}{3}+\frac{2}{6}=$ how many sixths?
3. How many sixths $= \frac{1}{2}$?	$\frac{1}{2}+\frac{1}{6}=$ how many sixths?
4. How many sixths $= \frac{1}{3}$?	$\frac{1}{3}+\frac{3}{6}=$ how many sixths?
5. How many sixths $= \frac{2}{3}$?	$\frac{1}{2}+\frac{1}{3}=$ how many sixths?
6. How many halves $= \frac{3}{6}$?	$\frac{1}{2}+\frac{2}{3}=$ how many sixths?

1. How much more is $\frac{1}{3}$ than $\frac{1}{6}$? How much more is $\frac{1}{2}$ than $\frac{1}{3}$?

2. How much more is $\frac{2}{3}$ than $\frac{1}{2}$? How much more is $\frac{5}{6}$ than $\frac{2}{3}$?

3. How many sixths equal $1\frac{1}{6}$? $1\frac{1}{3}$? $1\frac{2}{3}$? $1\frac{1}{2}$?

4. How many thirds equal $\frac{2}{6}$? $\frac{4}{6}$? $\frac{6}{6}$?

5. $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}=$ how many sixths? $\frac{1}{2}+\frac{1}{3}+\frac{2}{6}=$ how many sixths?

6. $1+\frac{1}{3}=$ how many thirds? how many sixths?

1. How many times is $\frac{1}{3}$ contained in 1? $1 \div \frac{1}{3} = ?$
2. How many times is $\frac{1}{3}$ contained in $1\frac{1}{3}$? $1\frac{1}{3} \div \frac{1}{3} = ?$
3. How many times is $\frac{1}{3}$ contained in $1\frac{2}{3}$? $1\frac{2}{3} \div \frac{1}{3} = ?$
4. How many times is $\frac{1}{3}$ contained in 2? $2 \div \frac{1}{3} = ?$
5. How much is $\frac{1}{2}$ of $\frac{2}{3}$?   How much is $\frac{1}{2}$ of $\frac{1}{3}$?
6. How much is $\frac{1}{3}$ of $\frac{1}{2}$?   4 times $\frac{1}{6}$ = how many thirds?
7. How many times is $\frac{1}{6}$ contained in $\frac{1}{3}$? $\frac{1}{3} \div \frac{1}{6} = ?$
8. How many times is $\frac{1}{6}$ contained in $\frac{2}{3}$? $\frac{2}{3} \div \frac{1}{6} = ?$
9. How many times is $\frac{1}{6}$ contained in $1\frac{1}{3}$? $1\frac{1}{3} \div \frac{1}{6} = ?$

1. $\frac{1}{6}$ is what part of $\frac{2}{6}$? of $\frac{3}{6}$? of $\frac{4}{6}$? of $\frac{1}{3}$?
2. $\frac{1}{6}$ is what part of $\frac{2}{3}$? $\frac{1}{6}$ is what part of $\frac{1}{2}$?
3. How many thirds equal $4\frac{1}{3}$? $8\frac{2}{3}$? $9\frac{2}{3}$?
4. How many sixths equal $3\frac{1}{6}$? $4\frac{3}{6}$? $9\frac{5}{6}$?
5. Change to whole or mixed numbers:

$\frac{9}{3}$; $\frac{18}{3}$; $\frac{21}{3}$; $\frac{25}{3}$; $\frac{12}{6}$; $\frac{18}{6}$; $\frac{24}{6}$; $\frac{27}{6}$; $\frac{28}{3}$; $\frac{45}{6}$; $\frac{35}{5}$.

6. How many times is $\frac{3}{2}$ contained in $\frac{6}{2}$? in $\frac{15}{2}$?
7. How many times is $\frac{3}{4}$ contained in $\frac{6}{4}$? in $\frac{18}{4}$? in $\frac{21}{4}$?
8. How many times is $\frac{5}{6}$ contained in $\frac{10}{6}$? in $\frac{15}{6}$? in $\frac{35}{6}$?

Find the sum of $23\frac{1}{3}$ and $16\frac{1}{2}$.

MODEL. — $\frac{1}{2} = \frac{3}{6}$; $\frac{1}{3} = \frac{2}{6}$; $\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$.

$23 + 16 = 39$; $39 + \frac{5}{6} = 39\frac{5}{6}$, *Ans.*

Find the sum of :

	a.	b.	c.
1.	$24\frac{2}{3}$ and $18\frac{1}{6}$	$17\frac{1}{2}$ and $29\frac{2}{3}$	$161\frac{2}{3}$ and $146\frac{1}{3}$
2.	$45\frac{1}{2}$ and $22\frac{1}{3}$	$46\frac{2}{3}$ and $41\frac{5}{6}$	$134\frac{1}{2}$ and $139\frac{4}{6}$
3.	$76\frac{1}{6}$ and $47\frac{1}{2}$	$76\frac{1}{2}$ and $36\frac{2}{3}$	$168\frac{2}{3}$ and $246\frac{1}{2}$

Subtract $45\frac{1}{2}$ from $71\frac{2}{3}$.

MODEL. — $71\frac{2}{3} = 71\frac{4}{6}$

$45\frac{1}{2} = \dfrac{45\frac{3}{6}}{26\frac{1}{6}}$, *Ans.*

Subtract :

	a.	b.
1.	$29\frac{1}{3}$ from $49\frac{2}{3}$	$38\frac{1}{6}$ from $71\frac{1}{3}$
2.	$18\frac{1}{2}$ from $21\frac{2}{3}$	$29\frac{2}{3}$ from $68\frac{5}{6}$
3.	$25\frac{1}{3}$ from $41\frac{1}{2}$	$45\frac{1}{2}$ from $74\frac{5}{6}$

c.

1. $\$ 24.16\frac{1}{3}$ from $\$ 43.68\frac{5}{6}$

2. $\$ 39.04\frac{1}{2}$ from $\$ 62.62\frac{5}{6}$

3. $\$ 47.21\frac{1}{6}$ from $\$ 79.20\frac{1}{2}$

Subtract $24\frac{2}{3}$ from 81.

MODEL. — $81\ \ = 80\frac{3}{3}$

$24\frac{2}{3} = \dfrac{24\frac{2}{3}}{56\frac{1}{3}}$, *Ans.*

4. $21 - 13\frac{1}{3} =$ $46 - 24\frac{5}{6} =$ $73 - 49\frac{2}{3} =$ $84 - 26\frac{3}{6} =$

Add:

1.	2.	3.	4.	5.
$21\frac{1}{3}$	$84\frac{1}{6}$	$29\frac{2}{3}$	$46\frac{3}{4}$	$84\frac{5}{6}$
$14\frac{2}{3}$	$27\frac{1}{3}$	$16\frac{5}{6}$	$29\frac{1}{2}$	$29\frac{1}{3}$
$17\frac{1}{2}$	$18\frac{1}{2}$	$24\frac{1}{2}$	$18\frac{1}{8}$	$46\frac{1}{2}$

6.	7.	8.	9.	10.
$21\frac{1}{2}$	$29\frac{3}{4}$	$28\frac{1}{3}$	$76\frac{3}{4}$	$346\frac{1}{3}$
93	$17\frac{1}{2}$	$62\frac{5}{6}$	$46\frac{1}{2}$	$729\frac{2}{3}$
$74\frac{2}{3}$	$43\frac{1}{4}$	41	$29\frac{5}{8}$	$346\frac{1}{6}$
$76\frac{1}{2}$	$29\frac{1}{8}$	$79\frac{1}{2}$	$46\frac{7}{8}$	$429\frac{1}{2}$

Subtract:

1.	2.	3.	4.	5.
$73\frac{5}{6}$	$71\frac{2}{3}$	85	53	$76\frac{1}{2}$
$24\frac{1}{6}$	$45\frac{1}{2}$	$24\frac{2}{3}$	$26\frac{5}{6}$	$49\frac{1}{3}$

6.	7.	8.	9.	10.
$23\frac{1}{3}$	$84\frac{1}{2}$	$51\frac{2}{3}$	$92\frac{5}{6}$	$84\frac{7}{8}$
$18\frac{1}{6}$	$29\frac{1}{6}$	$18\frac{1}{6}$	$27\frac{1}{2}$	$76\frac{3}{4}$

	a.	b.	c.
1.	$18\frac{2}{3} + 14\frac{1}{2} - 12\frac{1}{6} =$	$842\frac{2}{3} \div 2 =$	$\frac{1}{7}$ of $\frac{7}{8} =$
2.	$81\frac{5}{6} - 27\frac{1}{2} + 44\frac{1}{3} =$	$725\frac{5}{6} \div 5 =$	$\frac{1}{3}$ of $\frac{15}{8} =$
3.	$74\frac{3}{4} - 29\frac{1}{2} + 16\frac{1}{4} =$	$639\frac{3}{4} \div 3 =$	$\frac{1}{4}$ of $\frac{24}{3} =$
4.	$16\frac{2}{3} + 41\frac{5}{6} - 29\frac{1}{3} =$	$287\frac{7}{8} \div 7 =$	$\frac{1}{5}$ of $\frac{25}{6} =$
5.	$24\frac{5}{6} + 17\frac{1}{2} - 19\frac{1}{6} =$	$805\frac{5}{8} \div 5 =$	$\frac{1}{6}$ of $\frac{18}{4} =$

1. John weighs $124\frac{3}{4}$ lb., and his brother William weighs $8\frac{1}{2}$ lb. more. Find William's weight. What is the weight of both together?

2. From a web of muslin containing 40 yards there were sold at one time $14\frac{1}{4}$ yards, and at another time $16\frac{1}{2}$ yards. How many yards were left?

3. At $\$6\frac{2}{3}$ a ton, how much will $\frac{1}{2}$ of a ton of coal cost? How much will 10 tons cost?

4. Find the cost of $\frac{2}{3}$ of a pound of tea, when 2 pounds cost $\$1.30$.

5. $1\frac{1}{2}$ ft. $+ 2\frac{2}{3}$ ft. $+ 7\frac{5}{6}$ ft. equal how many inches?

6. A lady paid $\$6\frac{2}{3}$ for a hat, and $\$3\frac{1}{2}$ for a pair of shoes. How much did she pay for both?

7. $\frac{2}{3}$ hr. $+ \frac{3}{4}$ hr. $+ \frac{5}{6}$ hr. $+ \frac{1}{2}$ hr. equal how many minutes?

8. If $\frac{1}{3}$ of the cost of a pair of overshoes is 20$\cent$, how much will 3 pairs cost?

9. $1\frac{1}{2}$ yd. $+ 2\frac{2}{3}$ yd. $+ 5\frac{1}{3}$ yd. equal how many feet?

10. A man raised 136 bu. of potatoes and sold $\frac{1}{4}$ of them to one man and $24\frac{3}{4}$ bu. to another man. How many bushels remained?

11. At $5\frac{3}{4}\cent$ a pound how much will 20 pounds of sugar cost?

I. ORAL WORK

What is the sum of:

a.	b.	c.
1. $\frac{1}{2}$ and $\frac{1}{3}$?	$\frac{2}{3}$ and $\frac{1}{2}$?	$1\frac{1}{2}$ and $\frac{3}{4}$?
2. $\frac{1}{2}$ and $\frac{1}{4}$?	$\frac{2}{3}$ and $\frac{1}{6}$?	$1\frac{1}{3}$ and $\frac{1}{6}$?
3. $\frac{1}{3}$ and $\frac{1}{6}$?	$\frac{1}{4}$ and $\frac{5}{8}$?	$2\frac{1}{4}$ and $\frac{1}{2}$?
4. $\frac{3}{6}$ and $\frac{1}{2}$?	$\frac{1}{2}$ and $\frac{3}{8}$?	$1\frac{3}{4}$ and $\frac{1}{8}$?
5. $\frac{3}{4}$ and $\frac{1}{2}$?	$\frac{1}{2}$ and $\frac{5}{6}$?	$1\frac{7}{8}$ and $\frac{1}{4}$?

II. ORAL WORK

a.	b.
1. $\frac{15}{3}$ = how many 1's?	$\frac{1}{3} + \frac{5}{6}$ = how many sixths?
2. $\frac{27}{3}$ = how many 1's?	$\frac{1}{2} + \frac{3}{4}$ = how many eighths?
3. $\frac{36}{3}$ = how many 2's?	$1 - \frac{2}{3}$ = how many sixths?
4. $\frac{48}{6}$ = how many 4's?	$2 - \frac{3}{4}$ = how many fourths?

III. ORAL WORK

1. A man bought $\frac{1}{2}$ of an acre of. land and sold $\frac{1}{3}$ of it. What part of an acre did he sell? What part of an acre had he left?

2. A man gave $\frac{1}{3}$ of his estate to his wife, $\frac{1}{2}$ to his son, and the remainder to his daughter. What part of the estate did the daughter receive?

3. At $\$\frac{1}{6}$ a bushel, how many bushels of wheat bran can be bought for $\$5$?

I. WRITTEN WORK

How much is $5 \times 7\frac{2}{3}$?

MODEL. —

$$5 \times 7 = 35$$
$$5 \times \tfrac{2}{3} = \tfrac{10}{3} = 3\tfrac{1}{3}$$
$$\overline{5 \times 7\tfrac{2}{3} = 38\tfrac{1}{3}}, \; Ans.$$

a.	*b.*
1. How much is $7 \times 8\frac{2}{3}$?	How much is $8 \times \$8\frac{2}{3}$?
2. How much is $6 \times 13\frac{1}{3}$?	How much is $9 \times \$13\frac{5}{3}$?
3. How much is $5 \times 15\frac{3}{6}$?	How much is $7 \times \$5.33\frac{1}{3}$?
4. How much is $8 \times 17\frac{5}{6}$?	How much is $4 \times \$7.66\frac{2}{3}$?
5. How much is $8 \times 18\frac{2}{3}$?	How much is $5 \times \$9.06\frac{5}{6}$?

II. WRITTEN WORK

Divide 25 by $1\frac{1}{4}$.

MODEL. —

$$1\tfrac{1}{4} = \tfrac{5}{4}.$$
$$25 = \tfrac{100}{4}.$$
$$\tfrac{100}{4} \div \tfrac{5}{4} = 100 \div 5 = 20, \; Ans.$$

We change both dividend and divisor to *fourths*, and divide the numerators. Since a number contains 4 times as many *fourths* as *ones*, $25 = 4$ times 25, or $\frac{100}{4}$.

a.	*b.*	*c.*
1. $45 \div 3\frac{3}{4} =$	$80 \div 3\frac{1}{3} =$	$180 \div 2\frac{1}{2} =$
2. $45 \div 1\frac{2}{3} =$	$75 \div 3\frac{1}{8} =$	$250 \div 16\frac{2}{3} =$
3. $75 \div 2\frac{1}{2} =$	$200 \div 33\frac{1}{3} =$	$124 \div 15\frac{1}{2} =$

Divide $81\frac{1}{4}$ by $6\frac{1}{4}$.

MODEL. — $6\frac{1}{4} = \frac{25}{4}$.
$81\frac{1}{4} = \frac{325}{4}$.
$\frac{325}{4} \div \frac{25}{4} = 325 \div 25 = 13$, *Ans.*

We change both dividend and divisor to the same denominator, and divide the numerators.

a.	*b.*
1. Divide $66\frac{2}{3}$ by $33\frac{1}{3}$	Divide $159\frac{3}{8}$ by $3\frac{1}{8}$
2. Divide $243\frac{3}{4}$ by $6\frac{1}{4}$	Divide $47\frac{1}{4}$ by $5\frac{1}{4}$
3. Divide $232\frac{1}{2}$ by $15\frac{1}{2}$	Divide $141\frac{3}{4}$ by $15\frac{3}{4}$
4. Divide $262\frac{1}{2}$ by $12\frac{1}{2}$	Divide 240 by $13\frac{1}{3}$
5. Divide $166\frac{2}{3}$ by $16\frac{2}{3}$	Divide 180 by $7\frac{1}{2}$

Divide $87\frac{1}{2}$ by $8\frac{3}{4}$.

MODEL. — $8\frac{3}{4} = \frac{35}{4}$.
$87\frac{1}{2} = \frac{350}{4}$.
$\frac{350}{4} \div \frac{35}{4} = 350 \div 35 = 10$, *Ans.*

Since a number contains 4 times as many *fourths* as *ones*, we change $87\frac{1}{2}$ to fourths by multiplying by 4. (Lesson 60, Exercise II.)

1. $62\frac{1}{2} \div 6\frac{1}{4} =$ 3. $127\frac{1}{2} \div 4\frac{1}{4} =$ 5. $206\frac{2}{3} \div 5\frac{1}{6} =$

2. $262\frac{1}{2} \div 8\frac{3}{4} =$ 4. $97\frac{1}{2} \div 3\frac{1}{4} =$ 6. $361\frac{2}{3} \div 36\frac{1}{6} =$

GRAD. ARITH. IV. — 5

Find the cost of 35 yards of lace at:

	a.	*b.*
1.	$37\frac{1}{2}$ cents a yd.	$66\frac{2}{3}$ cents a yd.
2.	$16\frac{2}{3}$ cents a yd.	$12\frac{1}{2}$ cents a yd.
3.	$62\frac{1}{2}$ cents a yd.	$8\frac{1}{3}$ cents a yd.
4.	$33\frac{1}{3}$ cents a yd.	$87\frac{1}{2}$ cents a yd.
5.	$6\frac{1}{4}$ cents a yd.	$83\frac{1}{3}$ cents a yd.

Find the cost of:

1. 35 grammars at $\$\frac{3}{4}$ each.
76 lb. butter at $\$\frac{3}{8}$ per lb.

2. 86 lb. tea at $\$\frac{2}{3}$ per lb.
75 doz. eggs at $\$\frac{1}{4}$ per doz.

3. 96 gal. oil at $\$\frac{3}{8}$ per gal.
72 cans milk at $\$\frac{1}{6}$ each.

4. 54 lb. lard at $\$\frac{1}{6}$ per lb.
65 bu. wheat at $\$\frac{7}{8}$ per bu.

5. 48 yd. ribbon at $\$\frac{7}{8}$ per yd.
84 cans tomatoes at $\$\frac{1}{8}$ per can.

1. At $\$3\frac{1}{4}$ each, how many sheep can be bought for $\$65$?

2. At $\$2\frac{1}{2}$ a barrel, how many barrels of apples can be bought for $\$180$? for $\$75$?

3. At $\$16\frac{2}{3}$ per ton, how many tons of phosphate can be bought for $\$250$? for $\$750$?

1. At $13⅓ a ton, how many tons of hay can be bought for $240?

2. At $7½ per cwt., how many cwt. of beef can be bought for $180?

3. At $2½ per yard, how many yards of cloth can be bought for $300?

4. At $15½ each, how many sofas can be bought for $248?

5. At $3⅜ a ton, how many tons of coal can be bought for $150?

1. At $6¼ a dozen, how many dozen chairs can be bought for $243¾?

2. If a man saves $12½ a week, how many weeks will it take him to save $262½?

3. At $5¼ a barrel, how many barrels of flour can be bought for $47¼?

4. At $3⅛ each, how many hats can be bought for $159⅜?

5. At $3¾ a bushel, how many bushels of clover seed can be bought for $63¾?

6. At 7⅜ ¢ a pound, how many pounds of nails can be bought for 95⅞ ¢?

1. At $3¼ a pair, how many pairs of shoes can be bought for $97½?

2. At $4¼ a dozen, how many dozen penknives can be bought for $127½?

3. At $5⅙ a dozen, how many dozen socks can be bought for $206⅔?

4. If it takes 8¾ yards to make a dress, how many dresses can be made from 262½ yards?

Divide 128 by ⅔.

MODEL. — $128 = \frac{384}{3}$. $\frac{384}{3} \div \frac{2}{3} = 384 \div 2 = 192$, *Ans.*

We change 128 to *thirds* by multiplying by 3. (See Lesson 60, Ex. II.)

1. At $⅔ a pound, how many pounds of tea can you get for $64?

2. At $⅞ a bushel, how many bushels of wheat can be bought for $147?

3. At $⅜ per gallon, how many gallons of oil can be bought for $96?

4. At $¾ a bushel, how many bushels of sweet potatoes can be bought for $120?

5. At $⅚ each, how many neckties can be bought for $135?

1. How many grammars at $\$\frac{3}{4}$ each can be bought for $\$45$? for $\$483$?

2. How many cans of tomatoes at $\$\frac{1}{6}$ each can be bought for $\$24$?

3. At $\$\frac{3}{8}$ per pound, how many pounds of butter can be bought for $\$237$?

4. How many yards of ribbon at $\$\frac{5}{8}$ a yard can be bought for $\$125$?

How much will 7 dozen eggs cost at the rate of 3 dozen for 68 ¢?

MODEL. — 68 ¢ ÷ 3 = 22⅔ ¢ = cost of 1 dozen.
22⅔ ¢ × 7 = 158⅔ ¢ = $\$1.58\frac{2}{3}$ = cost of 7 dozen.

1. How much will 13 pounds of coffee cost at the rate of 4 pounds for 87¢?

2. How much will 3 dozen oranges cost at the rate of 3 oranges for 5¢?

3. Find the cost of 11 yards of cloth at the rate of 6 yards for $\$13$?

4. How much will 12 dozen bananas cost at the rate of 4 bananas for 5¢?

5. Find the cost of 9 cans of salmon at the rate of 2 cans for 45¢.

Subtract:

1.	2.	3.	4.	5.	6.
$18\frac{1}{3} = 17\frac{4}{3}$	$21\frac{3}{8}$	$46\frac{1}{6}$	$72\frac{1}{4}$	$63\frac{5}{8}$	$81\frac{1}{3}$
$9\frac{2}{3} = 9\frac{2}{3}$	$14\frac{5}{8}$	$27\frac{5}{6}$	$39\frac{3}{4}$	$47\frac{7}{8}$	$76\frac{2}{3}$

$Ans. = 8\frac{2}{3}$

7.		8.	9.	10.	11.
$24\frac{1}{2} = 24\frac{2}{4} = 23\frac{6}{4}$		$49\frac{1}{2}$	$64\frac{1}{2}$	$43\frac{1}{4}$	$74\frac{1}{3}$
$17\frac{3}{4} = 17\frac{3}{4} = 17\frac{3}{4}$		$28\frac{2}{3}$	$37\frac{5}{6}$	$19\frac{3}{8}$	$26\frac{1}{2}$

$Ans. = 6\frac{3}{4}$

12.	13.	14.	15.	16.	17.
$647\frac{1}{2}$	$301\frac{1}{4}$	$700\frac{1}{3}$	$821\frac{2}{3}$	$906\frac{1}{2}$	$983\frac{2}{3}$
$259\frac{5}{8}$	$207\frac{1}{2}$	$600\frac{1}{2}$	$379\frac{5}{6}$	$895\frac{2}{3}$	$687\frac{5}{6}$

Add:

1.	2.	3.	4.	5.	6.
$18\frac{1}{3}$	$8\frac{1}{4}$	$42\frac{5}{6}$	$39\frac{2}{3}$	$76\frac{1}{2}$	$81\frac{1}{2}$
$7\frac{1}{6}$	$17\frac{7}{8}$	$9\frac{1}{3}$	$74\frac{1}{4}$	$29\frac{3}{4}$	$92\frac{5}{6}$
$9\frac{5}{6}$	$21\frac{1}{2}$	$28\frac{1}{2}$	$82\frac{1}{2}$	$72\frac{5}{8}$	$17\frac{2}{3}$

7.	8.	9.	10.	11.	12.
$37\frac{1}{2}$	$42\frac{1}{4}$	$63\frac{1}{4}$	$39\frac{2}{3}$	$81\frac{1}{2}$	$12\frac{1}{2}$
$46\frac{2}{3}$	$27\frac{1}{2}$	$27\frac{3}{4}$	$63\frac{1}{2}$	$21\frac{1}{3}$	$42\frac{3}{4}$
$81\frac{1}{6}$	$92\frac{1}{4}$	$86\frac{1}{2}$	$41\frac{5}{6}$	$17\frac{1}{6}$	$16\frac{5}{8}$
$19\frac{1}{2}$	$17\frac{3}{4}$	$19\frac{5}{8}$	$22\frac{1}{3}$	$14\frac{1}{3}$	$41\frac{1}{4}$

I. WRITTEN WORK

	a.	b.	c.
1.	$28\frac{3}{4} + 19\frac{7}{8} =$	$71\frac{3}{8} - 43\frac{1}{2} =$	$540 \div 7\frac{1}{2} =$
2.	$6 \times 18\frac{2}{3} =$	$16\frac{1}{4} \div 3\frac{1}{4} =$	$93\frac{1}{3} - 48\frac{5}{6} =$
3.	$23\frac{1}{2} - 16\frac{3}{4} =$	$12 \times 23\frac{5}{8} =$	$5 \times \$\frac{7}{8} =$
4.	$73\frac{1}{2} + 3\frac{1}{2} =$	$135 \div 11\frac{1}{4} =$	$382\frac{1}{2} + 12\frac{3}{4} =$
5.	$40 \div \frac{5}{6} =$	$39\frac{3}{8} + 47\frac{3}{4} =$	$103\frac{1}{3} \div 5\frac{1}{6} =$

II. ORAL WORK

One Yard

$\frac{1}{4}$ yd. cost 15 c	$\frac{1}{4}$ yd. cost 15 c	$\frac{1}{4}$ yd. cost 15 c	$\frac{1}{4}$ yd. cost 15 c
$\frac{1}{2}$ yard		$\frac{1}{2}$ yard	

1. If $\frac{1}{4}$ of a yard of cloth costs 15¢, how much will $\frac{1}{2}$ of a yard cost? $\frac{3}{4}$ of a yard? 1 yard?

2. If 1 yard of cloth costs 60¢, how much will $\frac{1}{4}$ of a yard cost? $\frac{1}{2}$ of a yard? $\frac{3}{4}$ of a yard?

3. $\frac{1}{4}$ of a yard is what part of $\frac{1}{2}$ of a yard? $\frac{1}{4}$ of a yard is what part of $\frac{3}{4}$ of a yard?

4. If $\frac{1}{4}$ of a bushel of wheat costs 18¢, how much will $\frac{2}{4}$, or $\frac{1}{2}$, of a bushel cost? $\frac{3}{4}$ of a bu.? 1 bu.?

5. If 1 bu. of wheat costs 80¢, how much will $\frac{1}{4}$ of a bu. cost? $\frac{3}{4}$ of a bu.?

$\frac{1}{4}$ yd. cost 15^c	$\frac{1}{4}$ yd. cost 15^c	$\frac{1}{4}$ yd. cost 15^c	

1. If $\frac{3}{4}$ of a yard of cloth costs 45¢, what part of 45¢ will $\frac{1}{4}$ of a yard cost?

2. If $\frac{3}{4}$ of a yard of muslin costs 9¢, what part of 9¢ will $\frac{1}{4}$ of a yard cost? Show by a drawing. How much will $\frac{4}{4}$, or a whole yard cost? $\frac{1}{3}$?

3. If $20 is $\frac{5}{8}$ of what Henry earns in a month, how much does he earn in a month?

4. There are 18 hours in $\frac{3}{4}$ of a day. How many hours are there in 1 day? in $\frac{5}{6}$ of a day? in $\frac{7}{8}$ of a day? in $\frac{2}{3}$ of a day?

5. If $\frac{2}{3}$ of the distance between two places is 28 miles, what is the whole distance?

6. Find the cost of a suit of clothes, if $\frac{5}{8}$ of the cost is $15.

7. If $\frac{5}{6}$ of a man's yearly expenses is $500, what is $\frac{2}{3}$ of his expenses?

8. If $\frac{3}{4}$ of a man's weight is 120 pounds, what is $\frac{3}{8}$ of his weight?

9. If $\frac{7}{8}$ of a pole is 210 inches long, what is the length of the whole pole?

ORAL WORK

One

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$

1. How many ninths $= 1$? $\frac{1}{3}$? $\frac{2}{3}$?

2. $\frac{1}{3}$ of an apple is equal to how many ninths of an apple?

3. $\frac{2}{3}$ of an apple $=$ how many ninths of an apple?

4. 3 times $\frac{1}{9}=$ how many ninths? 6 times $\frac{1}{9}=$ how many thirds?

5. $\frac{1}{3}+\frac{2}{9}=$ how many ninths? $\frac{2}{3}$ minus $\frac{2}{9}=$ how many ninths?

One

One half		$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{3}$		$\frac{1}{3}$		$\frac{1}{3}$			

6. How many twelfths make 1? How many twelfths make $\frac{1}{2}$? $\frac{1}{3}$? $\frac{2}{3}$?

7. $\frac{1}{2}+\frac{1}{12}=$ how many twelfths? $\frac{1}{2}-\frac{1}{12}=$ how many twelfths?

8. $\frac{1}{3}+\frac{3}{12}=$ how many twelfths? $\frac{1}{3}-\frac{1}{12}=$ how many twelfths?

9. $\frac{4}{12}=$ how many thirds? $\frac{2}{3}+\frac{1}{12}=$ how many twelfths?

One Thirds Ninths

(Get answers from the above diagram.)

a.   *b.*

1. How many thirds $= 1$? $\frac{1}{3} + \frac{1}{9} =$ how many ninths?

2. How many ninths $= 1$? $\frac{1}{3} + \frac{5}{9} =$ how many ninths?

3. How many ninths $= \frac{1}{3}$? $\frac{2}{3} + \frac{1}{9} =$ how many ninths?

4. How many ninths $= \frac{2}{3}$? $1 + \frac{2}{9} =$ how many ninths?

5. How many ninths $= 1\frac{1}{3}$? $1 + \frac{2}{3} =$ how many ninths?

1. How much more is $\frac{1}{3}$ than $\frac{1}{9}$?   How much less is $\frac{1}{9}$ than $\frac{1}{3}$?

2. How many ninths $= 1\frac{5}{9}$? $2\frac{7}{9}$? $3\frac{1}{3}$? $4\frac{2}{3}$? .

3. How many thirds $= \frac{3}{9}$? $\frac{6}{9}$? $\frac{9}{9}$? $1\frac{3}{9}$?

4. $1 + \frac{1}{3} + \frac{1}{9} =$ how many ninths? $1 + \frac{2}{3} + \frac{1}{9} =$ how many ninths?

5. 6 times $\frac{1}{9} =$ how many thirds?

6. How many times is $\frac{1}{9}$ contained in 1? $1 \div \frac{1}{9} =$

7. How many times is $\frac{1}{9}$ contained in $\frac{1}{3}$? $\frac{1}{3} \div \frac{1}{9} =$

8. How many times is $\frac{1}{9}$ contained in $\frac{2}{3}$? $\frac{2}{3} \div \frac{1}{9} =$
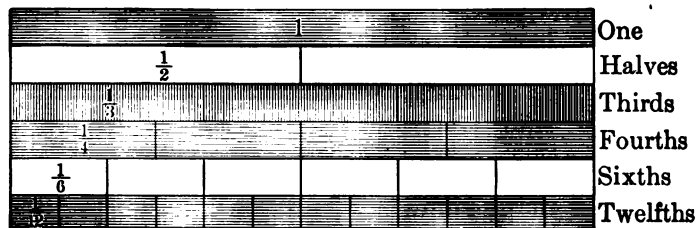
I. ORAL WORK

1. How many times is $\frac{1}{9}$ contained in $\frac{3}{9}$? $\frac{3}{9} \div \frac{1}{9} =$

2. How many times is $\frac{2}{9}$ contained in $\frac{4}{9}$? $\frac{4}{9} \div \frac{2}{9} =$

3. How many times is $\frac{1}{9}$ contained in $1\frac{1}{9}$? $1\frac{1}{9} \div \frac{1}{9} =$

4. How many times is $\frac{1}{9}$ contained in $1\frac{1}{3}$? $1\frac{1}{3} \div \frac{1}{9} =$

5. How many times is $\frac{1}{9}$ contained in 2? $2 \div \frac{1}{9} =$

6. How much is $\frac{1}{3}$ of $\frac{1}{3}$?   How much is $\frac{1}{3}$ of $\frac{6}{9}$?

7. 3 times $\frac{2}{9} =$ how many thirds? $\frac{15}{9} =$ how many thirds?

8. $1 + \frac{1}{3} + \frac{1}{9} =$ how many ninths? $1 + \frac{2}{3} + \frac{1}{9} =$ how many ninths?

9. $1 + \frac{2}{3} + \frac{4}{9} =$ how many ninths? $1 - \frac{3}{9} =$ $\frac{2}{3} - \frac{4}{9} =$

II. ORAL WORK

1. $\frac{1}{9}$ is what part of $\frac{1}{3}$? of $\frac{2}{3}$? $1\frac{1}{3} - \frac{1}{9} =$ $1\frac{2}{3} - \frac{1}{9} =$

2. Change to whole or mixed numbers: $\frac{18}{9}$; $\frac{21}{9}$; $\frac{27}{9}$; $\frac{32}{9}$; $\frac{36}{9}$; $\frac{38}{9}$; $\frac{45}{9}$; $\frac{50}{9}$; $\frac{54}{9}$.

3. How many times is $\frac{1}{3}$ contained in $\frac{3}{9}$? in $\frac{6}{9}$? in $\frac{27}{9}$?

4. $3 \times 1\frac{1}{3} =$ how many ninths? $2 \times 3\frac{3}{9} =$ how many thirds?

5. How many times is $\frac{3}{9}$ contained in $\frac{33}{9}$? $\frac{5}{9}$ in $\frac{45}{9}$?

6. $\frac{2}{3} - \frac{2}{9} =$ $1\frac{1}{3} - \frac{5}{9} =$ $3 \times \frac{6}{9} =$ how many thirds?

7. What is $\frac{1}{9}$ of 2? $\frac{1}{9}$ of 3? $\frac{1}{9}$ of 4? $\frac{1}{9}$ of 5?

8. What is $\frac{1}{3}$ of 1? $3\frac{3}{9}$? $6\frac{6}{9}$? $\frac{27}{3}$? $\frac{36}{3}$?

I. ORAL WORK

(Get answers from the above diagram.)

How many :

         a.   *b.*

1. Twelfths $= 1$? $\frac{1}{2}$? $\frac{1}{6} + \frac{1}{12} =$ how many twelfths?
2. Twelfths $= \frac{1}{2}$? $\frac{1}{3}$? $\frac{1}{6} + \frac{2}{12} =$ how many sixths?
3. Twelfths $= \frac{1}{4}$? $\frac{1}{6}$? $\frac{1}{4} + \frac{1}{6} =$ how many twelfths?

II. ORAL WORK

1. How much more is $\frac{1}{6}$ than $\frac{1}{12}$? How much less is $\frac{1}{12}$ than $\frac{1}{6}$?
2. How many twelfths $= \frac{2}{3}$? $\frac{3}{4}$? $\frac{3}{6}$? $\frac{5}{6}$?
3. How many twelfths $= \frac{1}{3} + \frac{1}{4}$? $\frac{1}{2} + \frac{1}{3}$? $\frac{2}{3} + \frac{1}{4}$?
4. $\frac{1}{6} - \frac{1}{12} =$ $\frac{1}{4} - \frac{1}{12} =$ $\frac{1}{4} - \frac{2}{12} =$ $\frac{1}{3} - \frac{1}{12} =$
5. $\frac{1}{3} - \frac{1}{6} =$ $\frac{2}{3} - \frac{3}{6} =$ $\frac{2}{3} - \frac{1}{12} =$ $\frac{3}{4} - \frac{1}{12} =$
6. $1 + \frac{5}{12} =$ $1\frac{1}{2} + \frac{1}{12} =$ $\frac{1}{3} + \frac{1}{4} =$ $\frac{1}{2} + \frac{1}{3} =$
7. $\frac{1}{3} + \frac{5}{12} =$ how many fourths? $\frac{3}{4} =$ how many times $\frac{1}{12}$?
8. $\frac{2}{3} + \frac{1}{6} =$ how many twelfths?
9. $\frac{2}{3} - \frac{1}{6} =$ how many twelfths?

I. ORAL WORK

1. How many times is $\frac{1}{12}$ contained in 1 ? $1 \div \frac{1}{12} =$

2. How many times is $\frac{1}{12}$ contained in $\frac{1}{2}$? $\frac{1}{2} \div \frac{1}{12} =$

3. 12 times $\frac{1}{12} =$ 12 times $\frac{1}{2} =$ 12 times $\frac{1}{3} =$

4. How many times is $\frac{1}{12}$ contained in $\frac{1}{3}$? $\frac{1}{3} \div \frac{1}{12} =$

5. How many times is $\frac{1}{12}$ contained in $\frac{1}{4}$? $\frac{1}{4} \div \frac{1}{12} =$

6. How many times is $\frac{1}{12}$ contained in $\frac{1}{6}$? $\frac{1}{6} \div \frac{1}{12} =$

7. 2 times $1\frac{1}{12} =$ how many twelfths? how many sixths?

8. $1\frac{1}{12} - \frac{5}{12} =$ $2 \div \frac{1}{12} =$ 3 times $1\frac{1}{6} =$ how many twelfths?

9. $1\frac{1}{2} - 1\frac{1}{12} =$ $1\frac{5}{6} =$ how many twelfths? $\frac{9}{12} \div \frac{3}{12} =$

II. ORAL WORK

1. $\frac{1}{12}$ is what part of $\frac{1}{6}$? of $\frac{2}{6}$? of $\frac{3}{6}$? of $\frac{5}{6}$?

2. $\frac{1}{12}$ is what part of $\frac{1}{4}$? of $\frac{3}{4}$? of $\frac{1}{3}$? of $\frac{2}{3}$?

3. Change to whole or mixed numbers: $\frac{24}{12}$; $\frac{28}{12}$; $\frac{36}{12}$; $\frac{45}{12}$; $\frac{48}{12}$; $\frac{54}{12}$; $\frac{72}{12}$.

4. How many times is $\frac{1}{4}$ contained in $\frac{9}{12}$? $\frac{9}{12} \div \frac{1}{4} =$

5. What is $\frac{1}{2}$ of $\frac{1}{6}$? $\frac{1}{2}$ of $\frac{1}{3}$? $\frac{1}{3}$ of $\frac{1}{4}$? $\frac{1}{3}$ of $\frac{9}{12}$?

6. What is $\frac{1}{12}$ of 2 ? $\frac{1}{12}$ of 3 ? $\frac{1}{12}$ of 4 ? $\frac{1}{12}$ of 5 ?

7. What is $\frac{1}{6}$ of 2 ? $\frac{1}{6}$ of 3 = how many twelfths?

8. What is $\frac{1}{12}$ of $\frac{36}{9}$? $\frac{1}{6}$ of $\frac{48}{9}$? $\frac{1}{4}$ of $\frac{28}{9}$?

Find the sum of $12\frac{1}{3}$ and $23\frac{1}{9}$.

MODEL.—$\frac{1}{3} = \frac{3}{9}$; $\frac{3}{9} + \frac{1}{9} = \frac{4}{9}$.

$12 + 23 = 35$; $35 + \frac{4}{9} = 35\frac{4}{9}$, *Ans.*

Find the sum of :

	a.	*b.*	*c.*
1.	$21\frac{1}{3}$ and $16\frac{1}{12}$	$45\frac{2}{3}$ and $17\frac{5}{9}$	$72\frac{5}{9}$ and $36\frac{1}{3}$
2.	$32\frac{1}{4}$ and $9\frac{5}{12}$	$54\frac{5}{6}$ and $13\frac{7}{12}$	$38\frac{3}{4}$ and $16\frac{11}{12}$
3.	$16\frac{2}{3}$ and $25\frac{5}{6}$	$29\frac{3}{4}$ and $56\frac{5}{12}$	$63\frac{2}{3}$ and $71\frac{7}{12}$

Subtract $18\frac{2}{3}$ from $41\frac{5}{9}$.

MODEL.—$41\frac{5}{9} = 40\frac{14}{9}$

$18\frac{2}{3} = 18\frac{6}{9}$

*Ans.* $= 22\frac{8}{9}$

Subtract :

	a.	*b.*	*c.*
1.	$14\frac{2}{3}$ from $21\frac{7}{9}$	$28\frac{1}{2}$ from $47\frac{2}{3}$	$41\frac{1}{2}$ from $70\frac{2}{3}$
2.	$25\frac{1}{6}$ from $42\frac{2}{3}$	$64\frac{1}{2}$ from $91\frac{1}{12}$	$26\frac{1}{3}$ from $75\frac{1}{9}$
3.	$37\frac{1}{2}$ from $54\frac{5}{12}$	$53\frac{7}{9}$ from $61\frac{2}{3}$	$54\frac{3}{4}$ from $91\frac{11}{12}$
4.	$32\frac{2}{3}$ from $63\frac{1}{6}$	$46\frac{2}{3}$ from $51\frac{1}{2}$	$43\frac{5}{6}$ from $81\frac{1}{12}$
5.	$41\frac{2}{3}$ from $50\frac{1}{12}$	$49\frac{5}{6}$ from $61\frac{5}{12}$	$26\frac{1}{2}$ from $45\frac{2}{12}$
6.	$29\frac{1}{4}$ from $53\frac{1}{6}$	$81\frac{1}{4}$ from $90\frac{2}{3}$	$47\frac{1}{4}$ from $76\frac{1}{12}$

Subtract $28\frac{5}{9}$ from 53.

$$\text{MODEL.} - 53 = 52\frac{9}{9}$$
$$29\frac{5}{9} = 29\frac{5}{9}$$
$$\overline{\text{Ans.} = 23\frac{4}{9}}$$

a.   *b.*

1. $42 - 17\frac{1}{9} =$ $\$128.38 - \$79.33\frac{2}{9} =$

2. $46 - 27\frac{5}{9} =$ $\$152.71 - \$84.34\frac{5}{6} =$

3. $37 - 19\frac{1}{12} =$ $\$183.92 - \$55.87\frac{7}{12} =$

Add :

1.	2.	3.	4.	5.	6.
$17\frac{1}{2}$	$25\frac{3}{4}$	$81\frac{1}{3}$	$81\frac{5}{9}$	$39\frac{3}{4}$	$79\frac{1}{4}$
$22\frac{2}{3}$	$18\frac{2}{3}$	$25\frac{5}{6}$	$17\frac{2}{3}$	$26\frac{1}{3}$	$37\frac{2}{3}$
$36\frac{1}{6}$	$17\frac{1}{12}$	$17\frac{1}{2}$	$29\frac{1}{9}$	$18\frac{5}{6}$	$41\frac{1}{6}$

7.	8.	9.	10.	11.	12.
$18\frac{2}{3}$	$63\frac{1}{3}$	$81\frac{1}{2}$	$79\frac{1}{6}$	$54\frac{1}{2}$	$16\frac{5}{9}$
$14\frac{2}{9}$	$25\frac{2}{3}$	$36\frac{2}{3}$	$44\frac{3}{4}$	$39\frac{2}{3}$	$42\frac{2}{3}$
$41\frac{7}{9}$	$76\frac{7}{9}$	$84\frac{3}{4}$	$38\frac{2}{3}$	$16\frac{3}{4}$	$17\frac{1}{9}$

13.	14.	15.	16.	17.	18.
$85\frac{2}{3}$	$81\frac{1}{2}$	$61\frac{3}{4}$	$72\frac{1}{3}$	$51\frac{5}{6}$	$47\frac{2}{3}$
$72\frac{1}{4}$	$27\frac{3}{4}$	$53\frac{2}{3}$	$39\frac{1}{9}$	$72\frac{3}{4}$	$16\frac{1}{2}$
$53\frac{5}{6}$	$9\frac{1}{3}$	$18\frac{1}{2}$	$53\frac{5}{9}$	$51\frac{1}{3}$	$41\frac{11}{12}$

LESSON 76

Subtract:

1.	2.	3.	4.	5.	6.
$51\frac{2}{3}$	$32\frac{3}{4}$	$81\frac{2}{3}$	$75\frac{1}{3}$	$53\frac{3}{4}$	$32\frac{1}{4}$
$27\frac{5}{9}$	$28\frac{1}{6}$	$54\frac{3}{4}$	$37\frac{5}{6}$	$24\frac{11}{12}$	$18\frac{1}{6}$

7.	8.	9.	10.	11.	12.
$33\frac{1}{3}$	$43\frac{1}{2}$	$74\frac{1}{2}$	$38\frac{1}{4}$	$45\frac{1}{3}$	$23\frac{2}{3}$
$24\frac{1}{2}$	$26\frac{5}{6}$	$37\frac{5}{12}$	$19\frac{5}{6}$	$26\frac{5}{9}$	$18\frac{7}{9}$

a.   *b.*

1. $17\frac{1}{2} + 14\frac{3}{4} - 18\frac{5}{6} + \frac{3}{4} =$ $37\frac{3}{4} + 16\frac{1}{2} - \frac{5}{6} + 14\frac{2}{3} =$

2. $46 - 39\frac{3}{4} + 28\frac{5}{12} - \frac{2}{3} =$ $38\frac{5}{9} + 46\frac{2}{3} - \frac{7}{9} + 23\frac{1}{3} =$

3. $84\frac{1}{2} - 27\frac{2}{3} + 16\frac{5}{6} + \frac{3}{4} =$ $42\frac{1}{3} - 25\frac{5}{9} + 6 + 34\frac{2}{3} =$

4. $79\frac{5}{6} - 26\frac{11}{12} + 14\frac{1}{2} - \frac{1}{3} =$ $76\frac{1}{2} + 34\frac{5}{8} - \frac{7}{8} + 46\frac{3}{4} =$

5. $84\frac{2}{3} + 46\frac{1}{9} - 39\frac{5}{9} + \frac{7}{9} =$ $81\frac{3}{4} - 36\frac{1}{8} + \frac{1}{2} - 31\frac{7}{8} =$

1. $3\frac{5}{12}$ quires = how many sheets? $5\frac{1}{12}$ yd. = how many inches?

2. $2\frac{4}{9}$ yd. = how many inches? $9\frac{7}{12}$ ft. = how many inches?

3. $5\frac{7}{12}$ days = how many hours? $2\frac{5}{9}$ gross = how many dozen?

4. $\frac{1}{2}$ yd. $+ \frac{3}{4}$ ft. $+ \frac{5}{9}$ yd. $+ \frac{5}{6}$ yd. = how many inches?

5. I bought rice for $11\frac{1}{4}$¢ a pound and sold it for $14\frac{2}{3}$¢ a pound. How much did I gain?

1. How many months are there in $7\frac{5}{12}$ yr.? in $8\frac{7}{12}$ yr.? in $3\frac{11}{12}$ yr.?

2. A farmer sold $21\frac{5}{6}$ bu. of wheat at one time and $38\frac{3}{4}$ bu. at another time. How many bushels did he sell in all?

3. A man raised $236\frac{2}{3}$ bu. of potatoes, and sold $129\frac{3}{4}$ bu. How many bushels had he left?

4. $\frac{2}{3}$ yd. $+ \frac{7}{9}$ yd. $+ \frac{3}{4}$ yd. $=$ how many inches? $\frac{5}{9}$ yd. $- 8\frac{3}{4}$ in. $=$

5. A lady bought 4 pieces of lace. They measured $4\frac{1}{3}$ yd., $5\frac{2}{3}$ yd., and $3\frac{5}{6}$ yd., respectively. How many yards did she buy?

6. $3\frac{1}{9}$ gross $+ 4\frac{2}{3}$ gross $+ 2\frac{5}{12}$ gross $+ 4\frac{5}{6}$ gross $+ 7\frac{3}{4}$ gross $=$ how many dozen?

7. From a piece of muslin containing 40 yd. there were sold $3\frac{2}{3}$ yd., $4\frac{1}{2}$ yd., $5\frac{3}{4}$ yd., and $6\frac{1}{6}$ yd. How many yards were left?

8. Find how long it will take a boy to learn his lesson in arithmetic if 15 min. equal $\frac{5}{12}$ of the required time.

9. $\frac{45}{12} =$ how many fourths? $\frac{64}{12} =$ how many thirds?

10. $12 equals $\frac{2}{3}$ of the cost of a suit of clothes. Find the cost.

11. $16\frac{3}{4} + \$32\frac{1}{2} - \$35\frac{5}{6} + \$\frac{2}{3} =$

Find the sum of :

	a.	*b.*	*c.*
1.	$\frac{1}{3}$ and $\frac{1}{2}$	$\frac{2}{9}$ and $\frac{2}{9}$	$\frac{2}{9}$ and $\frac{2}{3}$
2.	$\frac{1}{3}$ and $\frac{1}{9}$	$\frac{2}{3}$ and $\frac{5}{9}$	$\frac{3}{4}$ and $\frac{1}{6}$
3.	$\frac{1}{3}$ and $\frac{1}{6}$	$\frac{1}{3}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{5}{6}$
4.	$\frac{1}{3}$ and $\frac{4}{9}$	$\frac{1}{3}$ and $\frac{3}{4}$	$\frac{3}{4}$ and $\frac{5}{12}$
5.	$\frac{2}{3}$ and $\frac{1}{9}$	$\frac{2}{3}$ and $\frac{1}{4}$	$\frac{2}{3}$ and $\frac{11}{12}$

Find the difference between :

	a.	*b.*	*c.*
1.	$\frac{1}{3}$ and $\frac{1}{4}$	$\frac{1}{3}$ and $\frac{1}{9}$	$\frac{3}{3}$ and $\frac{5}{6}$
2.	$\frac{1}{2}$ and $\frac{1}{3}$	$\frac{1}{3}$ and $\frac{5}{6}$	$\frac{3}{4}$ and $\frac{5}{8}$
3.	$\frac{1}{2}$ and $\frac{3}{4}$	$\frac{7}{8}$ and $\frac{3}{4}$	$\frac{2}{3}$ and $\frac{5}{12}$
4.	$\frac{1}{6}$ and $\frac{1}{2}$	$\frac{5}{9}$ and $\frac{2}{3}$	$\frac{1}{4}$ and $\frac{7}{12}$
5.	$\frac{2}{3}$ and $\frac{1}{4}$	$\frac{2}{3}$ and $\frac{8}{9}$	$\frac{5}{6}$ and $\frac{3}{4}$

	a.	*b.*
1.	$\frac{18}{9}$ = how many 1's ?	$4\frac{2}{9}$ = how many ninths ?
2.	$\frac{54}{9}$ = how many 1's ?	$3\frac{5}{9}$ = how many ninths ?
3.	$\frac{81}{9}$ = how many 1's ?	$4\frac{8}{9}$ = how many ninths ?
4.	$\frac{48}{12}$ = how many 1's ?	$2\frac{5}{12}$ = how many twelfths ?
5.	$\frac{96}{12}$ = how many 1's ?	$3\frac{7}{12}$ = how many twelfths ?

I. WRITTEN WORK

How much is $6 \times 8\frac{5}{9}$?

$$\text{MODEL.} \quad \begin{array}{l} 6 \times 8 = 48 \\ 6 \times \frac{5}{9} = \frac{30}{9} = 3\frac{3}{9} \\ \hline Ans. = 51\frac{3}{9} = 51\frac{1}{3} \end{array}$$

      a.   *b.*

1. How much is $3 \times 12\frac{2}{9}$?   How much is $4 \times 9\frac{1}{12}$?
2. How much is $4 \times 13\frac{4}{9}$?   How much is $5 \times 13\frac{5}{12}$?
3. How much is $7 \times 16\frac{5}{9}$?   How much is $7 \times 18\frac{7}{12}$?
4. How much is $8 \times 23\frac{7}{9}$?   How much is $8 \times 26\frac{11}{12}$?

II. WRITTEN WORK

Divide 15 by $\frac{5}{9}$.

$$\text{MODEL.} \quad \begin{array}{l} 15 = \frac{135}{9}. \\ \frac{135}{9} \div \frac{5}{9} = 135 \div 5 = 27, \text{ } Ans. \end{array}$$

1. $10 \div \frac{5}{12} =$ 3. $35 \div \frac{7}{9} =$ 5. $25 \div \frac{5}{9} =$
2. $21 \div \frac{7}{12} =$ 4. $40 \div \frac{8}{9} =$ 6. $33 \div \frac{11}{12} =$

III. WRITTEN WORK

Divide $62\frac{1}{2}$ by $6\frac{1}{4}$.

$$\text{MODEL.} \quad \begin{array}{l} 6\frac{1}{4} = \frac{25}{4}. \\ 62\frac{1}{2} = \frac{250}{4}. \\ \frac{250}{4} \div \frac{25}{4} = 250 \div 25 = 10, \text{ } Ans. \end{array}$$

    1.   **2.**   **3.**   **4.**

$57\frac{1}{3} \div 7\frac{1}{6} =$ $85\frac{1}{3} \div 7\frac{1}{9} =$ $77\frac{1}{3} \div 4\frac{5}{6} =$ $150\frac{1}{2} \div 5\frac{3}{8} =$

1. Find the cost of 26 tons of hay at $12¾ a ton.

2. Find the cost of 92 bu. of wheat at 87½¢ a bu.

3. I paid $14¾ for bananas at $¼ per dozen. How many dozen did I buy?

4. I paid $12 for collars at $⅙ each. How many collars were bought?

5. How much will 14 hats cost at $2¾ each?

6. How many slate pencils at ½¢ each can you buy for $2.32?

7. How many window shades at $⅔ each can be bought for $20?

8. At $.37½ per dozen how many dozen lemons can be bought for $18?

9. How many sheep at $6¾ each can be bought for $54?

10. If 4 loads of wood cost $7, how much will 20 loads cost?

11. A man paid $75 for 6 doz. turkeys. How much was that per dozen?

12. I paid $1½ for 3 geese. How many geese at the same rate can I get for $25½?

13. A man paid $10.50 for 14 books. At the same rate how many books can be bought for $15.75?

1. How many pounds of meat at $\$\frac{1}{12}$ per pound can be bought for $\$4\frac{1}{2}$?

2. At $\$.64$ a pound, how much will 3 lb. 4 oz. of tea cost?

3. How many square feet are there in a room 12 ft. long and $10\frac{1}{2}$ ft. wide?

4. At 8¢ a quart, how much will 2 gal. 2 qt. 1 pt. of milk cost?

5. $\frac{3}{4}$ of my money is $\$26$. How much is $\frac{1}{2}$ of it?

6. At $\$\frac{3}{4}$ a yard, how many yards of ribbon will $\$18$ buy?

7. How much will it cost to carpet a room 21 ft. long, 18 ft. wide, at $\$1\frac{1}{4}$ a sq. yd.?

8. If 125 tons of coal cost $\$343.75$, how much will 325 tons cost?

9. If $\frac{5}{9}$ of a ton of coal costs $\$1.25$, how much will 1 ton cost?

10. If $\frac{3}{4}$ of a bushel of apples costs 25¢, how much will 1 bu. cost? 8 bu.?

11. If there are 40 pounds in $\frac{2}{3}$ of a bushel of wheat, how many pounds are there in 12 bushels?

12. Find the cost of 25 cows if $\frac{5}{8}$ of the price of one cow is $\$30$?

I. WRITTEN WORK

1. A mechanic earns $2½ a day, and pays $¾ a day for his board. In how many days can he save $140?

2. I bought 6 lb. 7 oz. of ham at 16¢ a pound, and 8 lb. 8 oz. of beef at 8¢ a pound, and paid for it with a 5-dollar bill. What was the correct change?

| *a.*	*b.*	*c.*
1. $½ = — cents	$ $\frac{1}{9}$ = — cents	$ $\frac{7}{8}$ = — cents
2. $¼ = — cents	$ $\frac{1}{12}$ = — cents	$ $\frac{5}{6}$ = — cents
3. $⅛ = — cents	$ ¾ = — cents	$ ⅔ = — cents
4. $⅓ = — cents	$ ⅜ = — cents	$ $\frac{5}{12}$ = — cents
5. $⅙ = — cents	$ ⅝ = — cents	$ $\frac{7}{12}$ = — cents

II. WRITTEN WORK

1. I paid $2 for 9 doz. eggs. How much was that per dozen?

2. $\frac{1}{12}$ of the distance between two towns is 120 miles. Find ⅔ of the distance.

3. 12¾ bu. = — pk.   6. $16\frac{5}{12}$ yr. = — mo.

4. 25⅔ yd. = — ft.   7. $17\frac{7}{12}$ ft. = — in.

5. 21¾ hr. = — min.   8. $7⅜ = — ¢.

9. How many bushels of wheat at 65¢ a bushel are worth 130 doz. eggs at 18¢ a dozen?
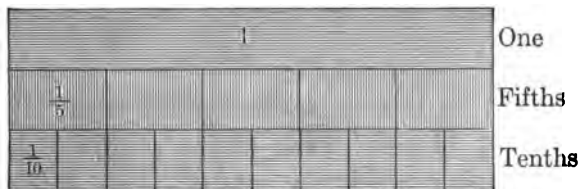
One

Fifths

Tenths

(Get answers from the above diagram.)

How many:

a.	b.
1. tenths $= 1$?	How many fifths $= 1$?
2. tenths $= \frac{1}{5}$?	$\frac{1}{5} + \frac{1}{10} =$ how many tenths?
3. tenths $= \frac{2}{5}$?	$\frac{1}{5} + \frac{3}{10} =$ how many tenths?
4. tenths $= \frac{3}{5}$?	$\frac{2}{5} + \frac{5}{10} =$ how many tenths?
5. tenths $= \frac{4}{5}$?	$\frac{3}{5} + \frac{7}{10} =$ how many tenths?

1. $\frac{1}{5}$ is how much more than $\frac{1}{10}$? $\frac{1}{10}$ is how much less than $\frac{1}{5}$?

2. How many times is $\frac{1}{10}$ contained in 1 ? $1 \div \frac{1}{10} =$

3. How many times is $\frac{1}{10}$ contained in $\frac{1}{5}$? $\frac{1}{5} \div \frac{1}{10} =$

4. $\frac{1}{5} - \frac{1}{10} =$ $\frac{2}{5} - \frac{3}{10} =$ $\frac{4}{5} - \frac{7}{10} =$ $\frac{4}{5} \div \frac{1}{5} =$

5. How many times is $\frac{2}{10}$ contained in $\frac{1}{5}$? $\frac{1}{5} \div \frac{2}{10} =$

6. $\frac{1}{5} + \frac{2}{10} =$ how many fifths? $\frac{4}{10} =$ how many fifths?

7. 2 times $1\frac{1}{10} =$ how many tenths? $1 + \frac{1}{5} =$ how many tenths?

8. $1 - \frac{1}{5} =$ $1 - \frac{3}{5} =$ $1\frac{1}{5} - \frac{2}{5} =$

1. $\frac{1}{10}$ is what part of $\frac{1}{5}$? of $\frac{2}{5}$? of $\frac{3}{5}$? of $\frac{4}{5}$?

2. $1 + \frac{1}{10} + \frac{1}{5} =$ how many tenths? $1 + \frac{1}{10} - \frac{1}{5} =$

3. Change to whole or mixed numbers: $\frac{25}{5}$; $\frac{31}{5}$; $\frac{35}{5}$; $\frac{38}{5}$; $\frac{48}{10}$; $\frac{53}{10}$; $\frac{70}{10}$; $\frac{89}{10}$.

4. How many times is $\frac{1}{5}$ contained in $\frac{2}{10}$? $\frac{2}{10} + \frac{1}{5} =$

5. How many fifths equal $7\frac{1}{5}$? $8\frac{3}{5}$? $6\frac{4}{5}$? $9\frac{2}{5}$?

6. How many tenths equal $3\frac{1}{10}$? $4\frac{3}{10}$? $8\frac{5}{10}$? $6\frac{7}{10}$? $8\frac{9}{10}$?

7. How many times is $\frac{1}{5}$ contained in $\frac{18}{5}$? in $\frac{24}{5}$? in $\frac{39}{5}$?

8. How many times is $\frac{3}{10}$ contained in $\frac{21}{10}$? in $\frac{27}{10}$? in $\frac{42}{10}$?

Find the sum of $5\frac{3}{5}$ and $19\frac{7}{10}$.

MODEL.— $\frac{3}{5} = \frac{6}{10}$; $\frac{6}{10} + \frac{7}{10} = \frac{13}{10} = 1\frac{3}{10}$.
$5 + 19 = 24$; $24 + 1\frac{3}{10} = 25\frac{3}{10}$, *Ans.*

Find the sum of:

	a.	*b.*	*c.*
1.	$29\frac{1}{5}$ and $32\frac{1}{10}$	$64\frac{1}{5}$ and $\frac{9}{10}$	$37\frac{3}{5}$ and $\frac{4}{10}$
2.	$18\frac{2}{5}$ and $26\frac{3}{10}$	$23\frac{3}{5}$ and $\frac{7}{10}$	$\frac{9}{10}$ and $7\frac{2}{5}$
3.	$22\frac{3}{5}$ and $17\frac{5}{10}$	$47\frac{1}{5}$ and $64\frac{7}{10}$	$\frac{7}{10}$ and $29\frac{4}{5}$
4.	$39\frac{4}{5}$ and $28\frac{7}{10}$	$53\frac{7}{10}$ and $\frac{4}{5}$	$56\frac{3}{5}$ and $72\frac{9}{10}$

Subtract $31\frac{3}{5}$ from $71\frac{3}{10}$.

MODEL. $-71\frac{3}{10} = 70\frac{13}{10}$
$31\frac{3}{5} = 31\frac{6}{10}$
$\overline{Ans. = 39\frac{7}{10}}$

Subtract:

a.	*b.*	*c.*
1. $24\frac{3}{5}$ from $31\frac{2}{5}$	$24\frac{4}{5}$ from $51\frac{3}{10}$	$28\frac{5}{10}$ from $71\frac{2}{5}$
2. $26\frac{1}{5}$ from $72\frac{1}{10}$	$35\frac{3}{5}$ from $81\frac{3}{10}$	$49\frac{7}{10}$ from $83\frac{4}{5}$
3. $45\frac{2}{5}$ from $81\frac{3}{10}$	$47\frac{3}{10}$ from $73\frac{1}{5}$	$26\frac{9}{10}$ from $72\frac{3}{5}$

Multiply $82\frac{3}{5}$ by 9.

MODEL. $-9 \times \frac{3}{5} = \frac{27}{5} = 5\frac{2}{5}$.
$9 \times 82 = 738.$
$738 + 5\frac{2}{5} = 743\frac{2}{5},\ Ans.$

Multiply:

a.	*b.*	*c.*
1. $21\frac{2}{5}$ by 8	$14\frac{5}{10}$ by 4	$36\frac{8}{10}$ by 9
2. $19\frac{1}{10}$ by 12	$36\frac{7}{10}$ by 3	$76\frac{4}{5}$ by 13
3. $28\frac{3}{10}$ by 9	$42\frac{4}{5}$ by 8	$32\frac{9}{10}$ by 12
4. $36\frac{3}{5}$ by 8	$63\frac{3}{10}$ by 9	$46\frac{3}{5}$ by 14
5. $21\frac{1}{5}$ by 13	$72\frac{9}{10}$ by 5	$58\frac{7}{10}$ by 21

I. WRITTEN WORK

Divide $12\frac{2}{5}$ by $3\frac{1}{10}$.

MODEL. — $3\frac{1}{10} = \frac{31}{10}$; $12\frac{2}{5} = \frac{62}{5} = \frac{124}{10}$.
$\frac{124}{10} \div \frac{31}{10} = 124 \div 31 = 4$, *Ans.*

Divide :

a.	b.	c.
1. $32\frac{4}{5}$ by $4\frac{1}{10}$	$44\frac{8}{10}$ by $5\frac{3}{5}$	$53\frac{2}{10}$ by $7\frac{3}{5}$
2. $26\frac{2}{5}$ by $3\frac{3}{10}$	$59\frac{1}{5}$ by $3\frac{7}{10}$	$61\frac{6}{10}$ by $8\frac{4}{5}$

II. ORAL WORK

Find the sum of :

a.	b.	c.
1. $\frac{1}{5}$ and $\frac{3}{10}$	$2\frac{3}{5}$ and $8\frac{1}{10}$	$3\frac{8}{10}$ and $4\frac{3}{5}$
2. $\frac{2}{5}$ and $1\frac{1}{10}$	$4\frac{3}{10}$ and $\frac{4}{5}$	$7\frac{2}{5}$ and $\frac{9}{10}$
3. $1\frac{1}{5}$ and $3\frac{2}{5}$	$3\frac{7}{10}$ and $4\frac{1}{5}$	$4\frac{4}{5}$ and $1\frac{7}{10}$
4. $2\frac{2}{5}$ and $7\frac{1}{10}$	$2\frac{3}{5}$ and $6\frac{3}{10}$	$1\frac{3}{5}$ and $8\frac{9}{10}$

III. ORAL WORK

Find the difference between :

a.	b.	c.
1. $\frac{3}{5}$ and $\frac{1}{10}$	$\frac{2}{5} + \frac{1}{10}$, and $\frac{7}{10}$	$2 \times \frac{3}{5}$, and $\frac{7}{10}$
2. $\frac{4}{5}$ and $\frac{5}{10}$	$\frac{3}{10} + \frac{3}{5}$, and $\frac{8}{10}$	$4 \times \frac{3}{10}$, and $\frac{4}{5}$
3. $\frac{2}{10}$ and $\frac{1}{5}$	$\frac{1}{5} + \frac{4}{10}$, and $\frac{4}{5}$	$4 \times \frac{7}{10}$, and $1\frac{1}{10}$
4. $\frac{7}{10}$ and $\frac{3}{5}$	$\frac{3}{5} + \frac{8}{10}$, and $\frac{9}{10}$	$5 \times \frac{4}{5}$, and $3\frac{1}{5}$
5. $\frac{9}{10}$ and $\frac{4}{5}$	$\frac{3}{5} + \frac{7}{10}$, and $\frac{4}{5}$	$6 \times \frac{7}{10}$, and $7\frac{2}{5}$

1. Find the cost of 46 lb. of sugar at $5\frac{1}{5}$¢ per pound.

2. At $\frac{2}{5}$¢ apiece, how many lemons can be bought for 40¢?

3. A man paid $\$32\frac{4}{5}$ for a barrel of sugar, and sold it for $\$37$. How much did he gain?

4. A grocer buys flour for $\$4\frac{4}{5}$ a barrel, and sells it for $\$5\frac{1}{5}$. Find the gain.

5. At $\$\frac{3}{5}$ a pound, how many pounds of tea can I get for $\$15$?

6. At $\$\frac{3}{10}$ a can, how many cans of salmon can you get for $\$18$?

7. Find the cost of 45 pairs of overshoes at $\$\frac{7}{10}$ a pair.

8. Find the cost of 3 pairs of shoes at $\$2.62\frac{5}{10}$ each.

9. $\frac{31}{5}$ = how many tenths? $\frac{50}{10}$ = how many fifths?

10. A man earned $\$14\frac{3}{5}$ one week, $\$15\frac{3}{10}$ the next, $\$13\frac{4}{5}$ the next, and $\$17\frac{9}{10}$ the next. How much did he earn in the four weeks?

11. A farmer bought 360 acres of land, and sold $42\frac{3}{5}$ acres to one man, and $125\frac{7}{10}$ acres to another. How many acres had he left?

1. A farmer sold two loads of hay. The first load weighed $1\frac{3}{5}$ tons, and the second $1\frac{3}{10}$ tons. How much did he receive for both loads at $ 10 a ton?

2. I bought three pieces of carpeting containing $24\frac{3}{4}$ yd., $26\frac{2}{3}$ yd., and $35\frac{7}{12}$ yd. respectively. How many yards were there in the three pieces together?

3. How many square inches are there in 4 panes of glass, each 32 in. long, and 16 in. wide?

4. How many feet equal 30 rd.? $14\frac{1}{2}$ yd.?

5. How much must be paid for $12\frac{3}{4}$ doz. bananas when $\frac{5}{6}$ of a dozen cost 20¢?

6. How much will 18 yd. of cloth cost at $ $3\frac{1}{5}$ a yard?

7. Find the cost of 14 gal. 2 qt. of alcohol at 75¢ a quart.

8. If 3 qt. of peaches cost 25¢, how much will $\frac{1}{2}$ of a bushel cost?

9. If 9 lb. of sugar cost $45\frac{9}{10}$¢, how much will 27 lb. cost?

	a.	*b.*
1.	$ $\frac{1}{5}$ + $ $\frac{1}{10}$ = — ¢	$ $\frac{3}{5}$ − $ $\frac{3}{10}$ = — ¢
2.	$ $\frac{4}{5}$ + $ $\frac{1}{10}$ = — ¢	$ $\frac{2}{5}$ + $ $\frac{3}{10}$ = — ¢
3.	$ $\frac{7}{10}$ − $ $\frac{3}{5}$ = — ¢	$ $\frac{9}{10}$ − $ $\frac{4}{5}$ = — ¢

1. If 5 yd. of velvet cost $5⅚, how much will 21 yd. cost?

2. A boy paid $$\frac{9}{10}$$ for a pair of skates, and ⅔ as much for a knife. How many cents more did he pay for the skates than for the knife?

3. Find the cost of 19 cwt. of straw at 62½¢ per hundredweight.

4. How many days, at $2¾ a day, will a man require to earn money enough to pay for a pair of trousers at $4¾, a vest at $3¼, a hat at $1½, and ½ doz. pairs of socks at $¼ a pair?

5. A man bought 80 bu. of potatoes at 60¢ a bushel. He sold ½ of them at 20¢ a peck, ¼ of the remainder at 30¢ a peck, and what still remained at 25¢ a peck. How much did he gain?

6. A bookkeeper pays ¼ of his monthly salary for rent, and ⅓ of the remainder for board, washing, etc. If he has $50 left, find his monthly salary.

7. A boy lost ¼ of his money, then found ⅓ of what he lost, and then had $20. How much money had he at first?

8. A man rode on his bicycle ⅔ of the distance between Wilkesbarre and New York one day, and the remaining distance, 54 miles, the next day. Find the distance.

I. ORAL WORK

One

Halves
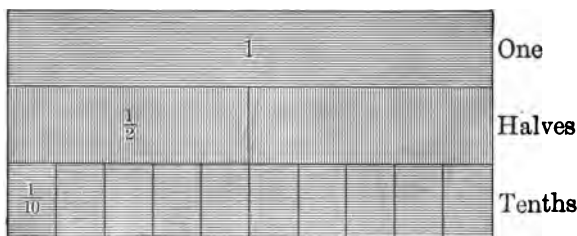
Tenths

(Get answers from the above diagram.)

1. How many tenths $=\frac{1}{2}$?

2. $\frac{1}{2}+\frac{2}{10}=$ how many tenths ?

3. $\frac{1}{2}+\frac{5}{10}=$ how many tenths ?

4. $1+\frac{1}{10}=$ how many tenths ?

5. $1-\frac{1}{10}=$ how many tenths ?

6. $\frac{1}{2}-\frac{1}{10}=$ how many tenths ?

II. ORAL WORK

1. How many times is $\frac{1}{10}$ contained in $\frac{1}{2}$? $\frac{1}{2} \div \frac{1}{10} =$

2. How many times is $\frac{2}{10}$ contained in $\frac{1}{2}$? $\frac{1}{2} \div \frac{2}{10} =$

3. $\frac{5}{10} =$ how many halves? $\frac{10}{10} =$ how many halves?

4. $\frac{5}{10} + \frac{1}{2} =$ how many halves ?

5. $\frac{15}{10} =$ how many halves? $\frac{20}{10} =$ how many halves?

6. $1 + \frac{1}{2} + \frac{1}{10} =$ how many tenths? $1 + \frac{5}{10} + \frac{1}{2} =$ how many ones ?

7. $\frac{2}{10} \div \frac{1}{10} =$ $\frac{1}{2} + \frac{5}{10} =$ $1 \div \frac{5}{10} =$ $1\frac{1}{2} \div \frac{1}{10} =$

I. ORAL WORK

	a.	*b.*	*c.*	*d.*
1.	$\frac{1}{2}+\frac{1}{5}=$	$1\frac{1}{2}+\frac{1}{5}=$	$\frac{1}{2}\div\frac{1}{5}=$	$2\frac{3}{4}+\frac{1}{3}=$
2.	$\frac{1}{2}+\frac{3}{5}=$	$1\frac{1}{2}-\frac{2}{5}=$	$\frac{1}{2}\div\frac{2}{5}=$	$3\frac{1}{3}-\frac{1}{2}=$
3.	$\frac{1}{2}+\frac{4}{5}=$	$2\frac{1}{2}+\frac{3}{5}=$	$1\frac{1}{2}\div\frac{1}{5}=$	$3\frac{3}{5}-\frac{6}{10}=$
4.	$\frac{3}{4}+\frac{2}{3}=$	$1\frac{1}{2}-\frac{1}{5}=$	$2\frac{1}{2}+\frac{3}{4}=$	$4\frac{1}{5}+\frac{1}{2}=$
5.	$\frac{1}{2}+\frac{2}{3}=$	$1\frac{1}{5}-\frac{1}{2}=$	$\frac{3}{4}+1\frac{2}{3}=$	$\frac{3}{5}+2\frac{1}{2}=$

II. WRITTEN WORK

Find the sum of $18\frac{1}{2}$ and $21\frac{3}{5}$.

MODEL.— $\frac{1}{2}=\frac{5}{10}$; $\frac{3}{5}=\frac{6}{10}$; $\frac{5}{10}+\frac{6}{10}=\frac{11}{10}=1\frac{1}{10}$.

$18+21=39$; $39+1\frac{1}{10}=40\frac{1}{10}$, *Ans.*

Find the sum of :

	a.	*b.*	*c.*
1.	$21\frac{1}{2}$ and $16\frac{1}{2}$	$45\frac{1}{2}$ and $17\frac{4}{5}$	$39\frac{3}{4}$ and $16\frac{1}{2}$
2.	$24\frac{2}{5}$ and $19\frac{1}{2}$	$18\frac{1}{2}$ and $26\frac{2}{3}$	$46\frac{2}{3}$ and $18\frac{5}{6}$
3.	$23\frac{3}{5}$ and $26\frac{1}{2}$	$46\frac{3}{5}$ and $34\frac{7}{10}$	$29\frac{3}{4}$ and $28\frac{7}{12}$

III. WRITTEN WORK

Find the difference between $37\frac{1}{2}$ and $19\frac{4}{5}$.

MODEL.— $37\frac{1}{2}=37\frac{5}{10}=36\frac{15}{10}$
$19\frac{4}{5}=19\frac{8}{10}$
$\overline{17\frac{7}{10}}$, *Ans.*

	a.	*b.*	*c.*
1.	$24\frac{1}{2}-17\frac{3}{5}=$	$28\frac{3}{5}-19\frac{1}{2}=$	$82\frac{2}{5}-79\frac{1}{2}=$
2.	$41\frac{1}{5}-36\frac{1}{2}=$	$91\frac{1}{2}-42\frac{4}{5}=$	$63\frac{2}{5}-37\frac{1}{2}=$

A **Unit** is any single thing; as a square, an apple, a line, etc.

A **Fraction** is a number of the equal parts of a unit; as $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{9}{10}$, and $\frac{8}{9}$.

Common Fractions are expressed by two numbers, or terms, called respectively **Numerator** and **Denominator.**

The **Denominator** shows into how many equal parts the unit is divided, and is written below a short horizontal line.

The **Numerator** shows the number of these equal parts taken, and is written above the line.

In the fraction $\frac{6}{7}$, the 7 shows that the unit is divided into *seven* equal parts, and is called the denominator of the fraction. The 6 shows how many of these equal parts are taken, and is called the numerator of the fraction.

A **Proper Fraction** is one whose numerator is less than the denominator.

An **Improper Fraction** is one whose numerator equals or exceeds the denominator.

Thus, $\frac{2}{3}$, $\frac{4}{5}$, $\frac{11}{12}$, are proper fractions, and $\frac{8}{8}$, $\frac{10}{9}$, $\frac{16}{11}$, improper fractions.

Tell which is the numerator and which the denominator of each of the following: $\frac{9}{11}$; $\frac{12}{13}$; $\frac{15}{19}$; $\frac{45}{36}$.

If a unit is divided into 10 equal parts, one of these parts is called $\frac{1}{10}$ of a unit. If $\frac{1}{10}$ of a unit is divided into 10 equal parts, one part is $\frac{1}{10}$ of $\frac{1}{10}$, or $\frac{1}{100}$ of a unit. If $\frac{1}{100}$ of a unit is divided into 10 equal parts, one part is $\frac{1}{10}$ of $\frac{1}{100}$, or $\frac{1}{1000}$ of a unit, and so on. From these continuous tenth, or decimal, divisions of the unit, there arises a class of fractions called *decimal fractions*.

A **Decimal Fraction** may, therefore, be defined as a number of the decimal division of a unit, as $\frac{1}{10}$, $\frac{4}{100}$, $\frac{5}{1000}$, $\frac{28}{10000}$.

The denominator of a decimal fraction is always 10, or the product arising from using 10 two or more times as a factor. That is, it is always 10, 100, 1000, 10,000, etc.

By the use of the **Decimal Point** (.) decimal fractions may be expressed without writing the denominator. They are then usually called **Decimals**. Thus, $\frac{5}{10}$ is written .5; $\frac{9}{10}$ is written .9; $\frac{6}{100}$ is written .06.

A **Pure Decimal** is made up of decimal figures only. Thus, .5, .12, .042.

When a whole number and decimal are written together the expression is sometimes called a **Mixed Decimal**. Thus, 4.5, 7.12, 9.056.

By examining the following table it will be seen that every decimal is composed of as many *decimal places* as there are ciphers in the denominator of the corresponding decimal fraction; that the first decimal place to the right of the decimal point is tenths; the second place, hundredths; the third place, thousandths; the fourth place, ten-thousandths, etc.

DECIMAL FRACTIONS	DECIMALS	HOW READ
$\frac{5}{10}$ . .	.5 .	5 tenths.
$\frac{9}{10}$ . .	.9 .	9 tenths.
$\frac{8}{100}$ . .	.08 .	8 hundredths.
$\frac{95}{100}$ . .	.95 .	95 hundredths.
$\frac{7}{1000}$ . .	.007 .	7 thousandths.
$\frac{84}{1000}$ . .	.084 .	84 thousandths.
$\frac{327}{1000}$ . .	.327 .	327 thousandths.
$\frac{6}{10000}$ . .	.0006 .	6 ten-thousandths.
$\frac{128}{10000}$ . .	.0128 .	128 ten-thousandths.
$\frac{728}{100000}$ . .	.00728 .	728 hundred-thousandths.

In decimals, as in whole numbers, the value of a figure depends upon its position. Thus, in .555, the second 5 is $\frac{1}{10}$ of the value of the first 5, and the third 5 is $\frac{1}{10}$ of the value of the second 5, and $\frac{1}{100}$ of the value of the first 5. Or, the first 5 equals 10 times the value of the second 5, and 100 times the third 5.

I. WRITTEN WORK

Express the following decimal fractions in the decimal form:

a.	b.	c.	d.
1. $\frac{5}{10} = .5$	$\frac{2}{100} = .02$	$\frac{8}{1000} = .008$	$\frac{6}{10000} = .0006$
2. $\frac{6}{10} =$	$\frac{8}{100} =$	$\frac{19}{1000} =$	$\frac{98}{10000} =$
3. $\frac{7}{10} =$	$\frac{25}{100} =$	$\frac{86}{1000} =$	$\frac{396}{10000} =$
4. $\frac{8}{10} =$	$\frac{32}{100} =$	$\frac{126}{1000} =$	$\frac{5689}{10000} =$
5. $\frac{9}{10} =$	$\frac{89}{100} =$	$\frac{496}{1000} =$	$\frac{1639}{10000} =$

II. WRITTEN WORK

Write the following decimals in fractional form:

a.	b.	c.	d.
1. $.3 = \frac{3}{10}$	$.17 = \frac{17}{100}$	$.064 = \frac{64}{1000}$	$.0342 = \frac{342}{10000}$
2. $.4 =$	$.29 =$	$.079 =$	$.0796 =$
3. $.6 =$	$.72 =$	$.324 =$	$.3729 =$

III. ORAL WORK

Read the following decimals:

	a.	b.	c.	d.
1.	.5	.025	.729	.0041
2.	.05	.7	.643	.0632
3.	.16	.48	.007	.0704
4.	.63	.276	.009	.0006
5.	.96	.429	.648	.1238

I. WRITTEN WORK

Write in decimal form:

	a.	b.	c.
1.	$6\frac{3}{10} = 6.3$	$23\frac{8}{100} = 23.08$	$21\frac{8}{1000} = 21.008$
2.	$8\frac{5}{10} =$	$74\frac{13}{100} =$	$46\frac{21}{1000} =$
3.	$7\frac{6}{10} =$	$37\frac{29}{100} =$	$72\frac{39}{1000} =$
4.	$9\frac{7}{10} =$	$46\frac{73}{100} =$	$84\frac{125}{1000} =$
5.	$8\frac{9}{10} =$	$56\frac{97}{100} =$	$97\frac{325}{1000} =$

II. WRITTEN WORK

Express in fractional form:

	a.	b.	c.
1.	$7.4 = 7\frac{4}{10}$	$8.07 = 8\frac{7}{100}$	$92.031 = 92\frac{31}{1000}$
2.	$8.3 =$	$9.36 =$	$39.009 =$
3.	$9.6 =$	$7.42 =$	$72.169 =$

III. WRITTEN WORK

Write the following in figures:

1. Four tenths; nine tenths; seven hundredths.

2. Eleven hundredths; twenty-nine hundredths; seventy-six hundredths.

3. Eight thousandths; fifty-four thousandths; three hundred twenty-eight thousandths.

4. Nine and thirty-six hundredths; twenty-four and thirty-three thousandths.

I. WRITTEN WORK

Change $\frac{1}{4}$ to a decimal.

MODEL. — $\frac{1}{4} = 1 \div 4 = 4)\underline{1.00}$
                              .25, *Ans.*

	a.	*b.*	*c.*	*d.*
1.	$\frac{1}{2} =$	$\frac{3}{5} =$	$\frac{3}{4} =$	$\frac{3}{8} =$
2.	$\frac{1}{5} =$	$\frac{4}{5} =$	$\frac{1}{8} =$	$\frac{5}{8} =$
3.	$\frac{2}{5} =$	$\frac{2}{4} =$	$\frac{2}{8} =$	$\frac{7}{8} =$

II. WRITTEN WORK

Find the sum of 7.3, .04, 2.36, 3.86, 7.161.

OPERATION

It will be seen that we write tenths under tenths, hundredths under hundredths, thousandths under thousandths, and add as in simple whole numbers.

7.3
.04
2.36
3.86
7.161
———
20.721

Find the sums of:

1. 2.8, 21.7, 38.9, 7.41, 29.06, 42.05.

2. 8.31, 7.46, 29.08, 42.07, 36.81, 42.78.

3. 42.61, 7.4, 92.8, 46.54, 72.07, .39.

4. 76.37, 4.2, 76.8, 49.05, 38.76, .09.

5. 8.061, 7.416, 8.406, 7.009, 8.216, 9.042.

I. WRITTEN WORK

1. Find the sum of 8 tenths; 21 hundredths; 6 tenths; 9 hundredths; 25 hundredths; 73 hundredths.

2. Find the sum of 3 and 8 tenths; 9 and 7 hundredths; 7 and 14 hundredths; 65 hundredths; 2 and 9 tenths; 8 and 125 thousandths.

3. Find the sum of 26 and 17 hundredths; 5 thousandths; 18 hundredths; 9 and 9 tenths; 4 and 16 thousandths.

II. ORAL WORK

	a.	b.	c.
1.	$1 + .5 =$	$.4 + .3 =$	$.8 + .06 =$
2.	$2 + 1.3 =$	$.4 + 6.7 =$	$.4 + .16 =$
3.	$4 + 1.4 =$	$8.1 + .9 =$	$.3 + .41 =$
4.	$3.2 + .5 =$	$2.3 + 6.8 =$	$.81 + .09 =$
5.	$4.7 + 1.6 =$	$4.1 + 2.9 =$	$.64 + .06 =$

III. WRITTEN WORK

	a.	b.	c.
1.	$\$1\frac{1}{4} = \$1.25$	$\$4\frac{3}{4} =$	$\$2.12\frac{1}{2} = \$2.125$
2.	$\$1\frac{1}{2} =$	$\$4\frac{2}{4} =$	$\$4.62\frac{1}{2} =$
3.	$\$2\frac{1}{5} =$	$\$1\frac{1}{8} =$	$\$3.41\frac{1}{4} =$
4.	$\$1\frac{2}{5} =$	$\$2\frac{2}{8} =$	$\$7.37\frac{1}{2} =$
5.	$\$4\frac{3}{5} =$	$\$3\frac{1}{8} =$	$\$6.12\frac{3}{4} =$

I. WRITTEN WORK

From 92.61 take 84.006.

The minuend and subtrahend are written so that units of the same order stand in the same column. When the number of decimal places in the subtrahend exceeds the number in the minuend, ciphers are generally annexed to the minuend to make both equal.

OPERATION

$$\begin{array}{r} 92.610 \\ 84.006 \\ \hline 8.604 \ Ans. \end{array}$$

	a.	b.
1.	From 29.6 take 17.5	From 7.4 take .36
2.	From 64.3 take 27.8	From 3.5 take .325
3.	From 26.04 take 18.1	From 1.1 take .99
4.	From 31.21 take 12.09	From 6.5 take 1.825
5.	From 25 take 19.12	From 91.601 take .899

II. ORAL WORK

	a.	b.	c.
1.	$\frac{7}{10} - .5 =$	$5\frac{7}{10} - 3.2 =$	$1.2 + 3.8$
2.	$.8 - \frac{3}{10} =$	$5.4 - .6 =$	$3.5 + 4.3$
3.	$.9 - .7 =$	$2\frac{1}{2} - 1.5 =$	$2.09 + .91$
4.	$1.3 - .5 =$	$8.3 - 7.6 =$	$4.1 - .9$
5.	$8 - .7 =$	$9 - 3.7 =$	$9.2 - .6$

I. ORAL WORK

	a.	*b.*	*c.*	*d.*
1.	$3 \times \frac{3}{10} = \frac{9}{10}$	$4 \times \frac{4}{10} = \frac{16}{10} = 1\frac{6}{10}$	$2 \times .9 =$	$6 \times .9 =$
2.	$3 \times .3 =$	$4 \times .4 =$	$4 \times .3 =$	$7 \times .8 =$
3.	$2 \times \frac{4}{10} =$	$5 \times .3 =$	$6 \times .4 =$	$9 \times .7 =$
4.	$2 \times .4 =$	$7 \times .4 =$	$8 \times .7 =$	$9 \times .8 =$

II. WRITTEN WORK

Multiply :

1.	2.	3.	4.	5.	6.	7.
4.3	3.2	7.5	.24	.76	.86	.625
4	6	3	3	4	7	5
17.2	19.2	22.5	.72	3.04	6.02	3.125

8.	9.	10.	11.	12.	13.	14.
.72	1.62	.98	.63	.326	.729	3.64
3	7	4	8	4	8	9

15.	16.	17.	18.	19.	20.	21.
39	45	87	36	57	86	83
.3	.6	.4	.7	.6	.7	.9
11.7						

III. WRITTEN WORK

	a.	*b.*	*c.*	*d.*
1.	$9 \times 4.5 =$	$.3 \times 19 =$	$12 \times 1.6 =$	$1.8 \times 19 =$
2.	$4 \times 18.6 =$	$.7 \times 26 =$	$14 \times .29 =$	$4.2 \times 16 =$
3.	$7 \times 14.06 =$	$.5 \times 42 =$	$16 \times 7.2 =$	$3.5 \times 47 =$
4.	$5 \times .06 =$	$.8 \times 29 =$	$15 \times 5.3 =$	$4.3 \times 37 =$

I. WRITTEN WORK

Multiply:

	a.	b.	c.
1.	4 × .36	.21 × 46	9 × 7.75
2.	7 × 47.3	2.1 × 46	23 × 4.25
3.	3.4 × 76	4.6 × 21	.11 × 321
4.	21 × 4.6	8 × .016	.06 × 212
5.	21 × .46	7 × .091	.9 × 426

II. WRITTEN WORK

Multiply 5.2 by 4.6.

OPERATION

We multiply as in whole numbers, and point off from the right as many decimal places in the product as there are in the multiplier and multiplicand together.

$$\begin{array}{r} 5.2 \\ 4.6 \\ \hline 312 \\ 208 \\ \hline 23.92, \textit{Ans.} \end{array}$$

Multiply:

	a.	b.	c.
1.	8.3 by 6.2	21.3 by .4	46.2 by .21
2.	9.4 by 8.3	23.1 by .7	32.6 by .45
3.	1.6 by 9.7	16.9 by 1.8	28.4 by .06
4.	2.7 by 4.9	23.5 by 7.2	39.3 by .08

	a.	*b.*	*c.*
1.	$.26 \div 2 =$	$9.3 \div 3 =$	$46.8 \div 2 =$
2.	$.48 \div 4 =$	$9.6 \div 4 =$	$38.6 \div 2 =$
3.	$.64 \div 2 =$	$7.5 \div 5 =$	$36.9 \div 3 =$
4.	$.56 \div 2 =$	$8.4 \div 7 =$	$37.2 \div 6 =$
5.	$.96 \div 4 =$	$8.4 \div 6 =$	$54.4 \div 4 =$

II. WRITTEN WORK

Divide:

1.	**2.**	**3.**	**4.**
8)43.60	7)57.47	4)24.96	8)25.92
5.45	8.21	6.24	3.24

5.	**6.**	**7.**	**8.**
9)37.44	7)33.04	5)41.25	6)56.16

9.
12)38.88(3.24
36
28
24
48
48

10.
13)54.08(4.16
52
20
13
78
78

11.
14)30.66(2.19
28
26
14
126
126

	a.	*b.*	*c.*
1.	$36.15 \div 15 =$	$59.85 \div 19 =$	$170.04 \div 39 =$
2.	$34.56 \div 16 =$	$77.91 \div 21 =$	$235.62 \div 42 =$
3.	$36.89 \div 17 =$	$110.88 \div 24 =$	$264.88 \div 56 =$
4.	$56.88 \div 18 =$	$105.28 \div 28 =$	$461.44 \div 64 =$

Divide 123.54 by 2.9.

We divide as in whole num-
bers. As the dividend is the
product of the divisor and quo-
tient, the number of decimal
places in the dividend should
equal the number in the divisor
and quotient taken together.
(See Lesson 101, Ex. II.) Now,

OPERATION

2.9)123.54(42.6, *Ans.*
　116
　─────
　　75
　　58
　─────
　　174
　　174
　─────

since there are *two* decimal places in the dividend,
and *one* in the divisor, there must be the difference
between *two* and *one,* or *one* decimal place in the
quotient.

Divide:

	a.	b.	c.
1.	203.52 by 6.4	120.28 by 12.4	703.54 by 5.8
2.	117.81 by 6.3	159.84 by 29.6	946.08 by 7.3
3.	183.92 by 7.6	347.25 by 46.3	1800.40 by 5.6
4.	152.52 by 8.2	162.54 by 38.7	699.84 by 21.6
5.	152.19 by 5.7	252.28 by 47.6	1044.24 by 7.6
6.	268.45 by 6.5	426.62 by 51.4	74.385 by 9.5
7.	94.72 by 7.4	$167.40 by $4.5	$458.64 by $7.2
8.	134.94 by 3.9	$407.36 by $7.6	$426.88 by $5.8

Divide 207 by 4.6.

When there are no decimal places in the dividend, we annex to the dividend as many decimal ciphers as there are decimal places in the divisor, and proceed as in Lesson 103.

OPERATION

4.6)207.0(45, *Ans.*
  184
  ───
  230
  230
  ───

Divide:

	a.	*b.*	*c.*
1.	180 by 7.2	185 ÷ 2.5	800 by 6.4
2.	204 by 2.4	342 ÷ 7.6	616 by 3.5
3.	266 by 7.6	378 ÷ 8.4	1183 by 6.5

II. WRITTEN WORK

	a.	*b.*	*c.*
1.	$24.6 + 19.03 =$	$682.44 ÷ 94 =$	$46.7 + .326 =$
2.	$43.2 - 27.35 =$	$55 × 14.6 =$	$729 - 4.79 =$
3.	$126 × 3.8 =$	$252 × 7.6 =$	$.06 × 29.5 =$
4.	$27.5 × 7.3 =$	$82.5 × 21.9 =$	$4.07 × 1.5 =$
5.	$341.22 ÷ 47 =$	$366.66 ÷ 37.8 =$	$110.2 + 38 =$
6.	$122.22 + 12.6 =$	$1023.66 ÷ 141 =$	$551 ÷ 14.5 =$
7.	$798 ÷ 9.5 =$	$2365 ÷ 27.5 =$	$23.22 + 8.6 =$

1. How many hundredths equal .2 ? .4 ? .8 ?

2. $.8 \div 2 =$ $.8 + .2 =$ $.25 \div 5 =$ $.25 \div .05 =$

3. $\$.09 + \$.03 =$ $\$.09 \div 3 =$ $\$.75 \div \$.25 =$
$\frac{1}{25}$ of $\$.75 =$

4. $.91 + .13 =$ $\$.91 \div \$.13 =$ $\$.91 \div 13 =$
$\frac{1}{13}$ of $\$.91 =$

5. At $\$.13$ a yard, how many yards of ribbon can you buy for $\$.91$?

6. If 13 yd. of ribbon cost $\$.91$, find the cost of 1 yd.

7. .1 of $5 =$ $.1 \times 5 =$ .1 of $12 =$ $.1 \times 12 =$
$.2 \times 12 =$

8. $1.2 \div .1 =$ $2.4 \div .2 =$ $.3 \times 9 =$ $2.7 \div .3 =$

9. $.8 - .08 =$ $.6 + 7.5 =$ $.4 \times 12 =$ $4.8 \div 4 =$

1. At 5¢ each, how many pencils can I buy for .5 of a dollar ?

2. At 2¢ each, how many lemons can I buy for .3 of a dollar ?

3. If .3 of a yard of silk costs .3 of a dollar, how much will 1 yd. cost ? 2.5 yd. ?

4. How much will 1.5 barrels of cider cost at $\$4$ a barrel ?

Divide:

	a.	*b.*	*c.*
1.	.672 by .21	3.816 ÷ .53	3.818 ÷ 4.6
2.	.672 by 3.2	3.956 ÷ .43	6.478 ÷ 7.9
3.	3.392 by .53	4.104 ÷ .76	3.773 ÷ 4.9
4.	2.241 by .27	2.183 ÷ .59	4.408 ÷ 7.6

1. Find the cost of 4.5 tons of coal at $2.75 a ton. Find the cost of 6.8 tons.

2. From a piece of land containing 189.75 acres there were sold at one time 43.8 acres, and at another time 22.6 acres. How many acres were left?

3. Find the cost of 8.3 yd. of cloth at $2.25 a yd.

4. A man sold 40 bu. of potatoes, which was .4 of all he raised. How many bushels did he raise?

5. If .8 of the cost of a horse is $40, what is the whole cost?

6. If a man can travel 11.206 mi. in 2.6 hr., how far can he travel in 1 hr.?

7. If a barrel of flour costs $4.25, how many barrels can be bought for $89.25?

8. Find the cost of 8.75 yd. of linen at $.65 a yd.

1. Find the sum of $4\frac{1}{2}$, $3\frac{2}{3}$, $7\frac{1}{3}$, $9\frac{3}{4}$, and $4\frac{1}{2}$.

2. A boy sold his bicycle for .7 of its cost, receiving for it $ 35. Find the cost.

3. How much will 8.6 bu. of wheat cost at $ .65 a bushel ?

4. At $ .48 a bushel, how many bushels of rye will $ 12 buy ?

5. At 14.5¢ an hour, how much will a boy earn in 9 hr. ? in 10 hr. ?

6. Find the cost of 8.8 sq. rd. of land at $ 1 per square rod.

7. Two men are 309.603 mi. apart. If they travel toward each other at the rate of 38.7 mi. and 25.4 mi. respectively per day, in how many days will they meet ?

8. Find the cost of 14.8 acres of land at $ 65.75 per acre.

9. A farmer raised 120 bu. of potatoes, and sold .65 of them at $ .40 a bushel. How much did he receive for them ?

10. How much will 21.5 yd. of bed ticking cost at $.37¢ a yard ?

11. A boy worked 5.5 days at $1.20 a day. How much did he earn ?

1. .8 of $ 160 is ½ of what a man paid for a horse and buggy. If the cost of the horse was $ 156, how much did the buggy cost ?

2. At $ .125 per pound, how many pounds of meat can be bought for $ 25 ?

3. 40 min. equaled .25 of the time it took a boy to ride from Wilkesbarre to Scranton on his bicycle. Find the whole time.

4. A man bought 12.5 yd. of cloth for $ 31.25. How much did he pay a yard ?

5. How many yards of tape at $ .125 a yard can be bought for $ 3.875 ?

6. If a man can walk 33.3 mi. in 9 hr., how far can he walk in 18.5 hr. ?

7. If 7 yd. of velvet cost $ 4.20, how much will 15.6 yd. cost ?

8. Find the cost of 27.5 lb. of fish at $ .145 a pound.

9. A man bought 25.75 lb. of tea and sold .2 of it. How many pounds remained ?

10. How many barrels of 31.5 gal. can be filled from a tank holding 1764 gal. ?

11. If 3.5 cords of wood cost $ 11.375, how much will 20 cords cost ?

1. From 2 and 2 tenths, take 2 tenths and 2 hundredths.

2. From 4 take 49 hundredths.

3. When butter is worth $.25 a pound, how many pounds can be bought for $9.25?

4. Divide 75 by $\frac{3}{5}$; by $\frac{3}{4}$; by $\frac{5}{8}$.

5. A man in one month paid $9½ for meat, $23¾ for groceries, and $12⅔ for other necessary expenses. If he received $60 as his month's wages, how much had he left?

6. A farmer raised 304 bu. of corn. He sold .25 of it at $.40 a bushel, and .5 of the remainder at $.36 a bushel. How much did he receive for what he sold, and how many bushels had he left?

7. A man, dying, left property valued at $4800, to be divided among his wife and 4 children. His wife was to receive ⅓, and the remainder was to be equally divided among his children. Find the share of each.

8. A man sold a horse for $125, and received in payment 12.5 yd. of cloth at $3.25 a yard, and the balance in tea at $.625 a pound. How many pounds of tea did he receive?

.**United States Money** is the lawful money of the United States. It consists of two kinds, — specie or coin, and paper money.

Specie or coin consists of metal, such as gold, silver, nickel, and bronze, stamped, and authorized by government to be used as money.

Name the gold coins; the silver coins; the nickel; the bronze.

Paper Money, issued for convenience in business transactions under authority of government, consists of printed promises to pay the bearer a stated amount on demand. National bank notes, United States notes, treasury notes, gold certificates, and silver certificates are some of the names of paper money now in circulation.

$$
\begin{aligned}
10 \text{ mills (m.)} &= 1 \text{ cent } (\textit{\rlap{/}c}) \\
10 \text{ cents} &= 1 \text{ dime (d.)} \\
10 \text{ dimes} &= 1 \text{ dollar } (\$) \\
10 \text{ dollars} &= 1 \text{ eagle (E.)}
\end{aligned}
$$

NOTE. — The *mill* is not coined.

Dollars are written as whole numbers with the dollar sign ($) prefixed. Dimes, cents, and mills are written as decimals, with the decimal point placed before tenths. Thus, 5 dollars 2 dimes 6 cents 3 mills are written $ 5.263.

The terms *eagle* and *dime* in business are read as *dollars* and *cents*. Thus, 4 dollars and 2 dimes are written $ 4.20, and read 4 dollars 20 cents. Also 5 eagles, 4 dollars, 3 dimes, and 2 cents are written $ 54.32, and read 54 dollars 32 cents.

The half-cent is written either as a fraction or as 5 mills. Thus, sixty-two and a half cents are written $ .62$\frac{1}{2}$ or $ .625.

Cents are frequently written as fractions of a dollar. Thus, $42.25 is often written $ $42\frac{25}{100}$, and read forty-two $\frac{25}{100}$ dollars.

1. How many cents are there in $$\frac{3}{5}$? in $$\frac{3}{4}$? in $$\frac{7}{8}$? in $$\frac{5}{6}$? in $$\frac{5}{9}$?

2. What part of a dollar is 5¢? 10¢? 20¢? 25¢?

3. 12$\frac{1}{2}$¢ = $\frac{1}{8}$ of a dollar.   6. 62$\frac{1}{2}$¢ = — of a dollar.

4. 16$\frac{2}{3}$¢ = — of a dollar.   7. 87$\frac{1}{2}$¢ = — of a dollar.

5. 37$\frac{1}{2}$¢ = — of a dollar.   8. 83$\frac{1}{3}$¢ = — of a dollar.

9. How many dollars = 800¢? 1000¢?

10. How many mills = $1? $2? $7?

11. How many eagles = $ 20? $ 70? $100?

12. What part of an eagle is $1? $3? $9?

13. What part of 2 eagles is $5? 2\frac{1}{2}$?

14. Find the sum of 4.5 eagles, .37$\frac{1}{2}$ of a dollar, and $\frac{3}{5}$ of a dime.

Since United States money is written in the decimal scale, all operations in addition, subtraction, multiplication, and division of United States money are performed in the same way as corresponding operations in decimals.

1. If 10.4 tons of coal cost $ 28.60, how much will 13.9 tons cost?

2. At $ .37½ per bushel, how many bushels of oats can be bought for $ 39.37½?

3. How many suits of clothes can be made from 130.2 yards of cloth, if 9.3 yards are required to make 1 suit?

4. Find the cost of 130.2 yards of cloth if 9.3 yd. cost $ 20.925.

5. If 21 tons of railroad iron cost $ 462, how much will 642.75 tons cost?

6. If 5.4 tons of hay cost $ 64⅘ ($ 64.80), how many tons at the same rate can be bought for $ 680.40?

7. A family of 5 persons spent in one year of 365 days $ 1642.50. What was the average expenditure of each person per day?

8. At $ .625 a yard, how many yards of merino can be bought for $ 33.75?

How much will 324 watermelons cost at $28 a hundred?

To change a number   OPERATION
to hundreds, we divide $324 \div 100 = 3.24$ hundreds.
it by 100, which is the $3.24 \times \$28 = \$90.72, \ Ans.$
same as pointing off *two*
places at the right.   Hence 324 equals 3.24 hundreds.
If *one* hundred melons cost $28, 3.24 hundred melons
will cost 3.24 times $28, or $90.72.

NOTE. — In business transactions C is frequently used to denote *one hundred*, and M *one thousand*.

1. What will be the cost of 345 fence posts at $14 per C?

2. At $2 a hundredweight, how much will 1462 pounds of buckwheat flour cost?

3. Find the value of 463 heads of cabbage at $4 per C.

4. If I pay $25.90 for 740 pickets for my front fence, how much is that per C?

5. Find the cost of 743 lb. of pork, at $5 per cwt.

6. How much will 18 pieces of muslin cost, each containing 40 yd., at $.085 a yard?

7. A man's income one year was $985.625, and his daily expenses averaged $1.875. How much did he save, counting 365 days to the year?

Find the cost of 5385 bricks at $7 per M.

To change a num-   OPERATION
ber to thousands, we
divide it by 1000,
which is the same

$$5385 \div 1000 = 5.385 \text{ thousands.}$$
$$5.385 \times \$7 = \$37.695, \textit{Ans.}$$

as pointing off *three* places at the right.   Hence 5385
equals 5.385 thousands.   If *one* thousand bricks cost
$7, the cost of 5.385 thousands will be 5.385 times
$7, or $37.695.

1. Find the cost of 8384 feet of hemlock boards
at $13 per M.

2. Find the cost of 6380 envelopes at $3 per M.

3. What is the value of 4383 feet of pine boards
at $45 per M?

4. What is the value of 7643 bricks at $8 per M?

5. Find the cost of 3684 shingles at $6 per M.

6. Mr. Brant bought 5340 cigars at $48 per M,
and sold them at $55 per M.   Find the gain.

7. How much will 6475 feet of flooring cost at $22
per M?

8. A dealer sold 325 tons of coal at $4.45 a ton,
and 324 tons at $4.50 a ton.   How much did he
receive for all?

WRITTEN WORK

Find the cost of 7846 pounds of hay at $11 a ton.

1 ton = 2000 lb.   OPERATION

Hence to change
pounds to tons we $7846 \div 2000 = 3.923$ tons.
divide the number $3.923 \times \$11 = \$43.153$, *Ans.*
representing the quantity by 2000, which is the
same as pointing off three places at the right for
decimals, and dividing by 2. Since the cost of 1 ton
is $11, the cost of 3.923 tons will be 3.923 times
$11, or $43.153.

1. Find the cost of 8764 pounds of hay at $12 per ton.

2. How much will 8360 pounds of phosphate cost at $28 a ton?

3. Find the cost of 7690 pounds of Peruvian guano at $65 a ton.

4. Find the cost of 47,250 pounds of coal at $3.25 a ton.

5. At $6 a ton what would be the cost of 250 pounds of furnace coal?

6. If a ton of sugar is bought for $80, at what price per pound must it be sold to gain $20?

7. If a ton of sugar was bought for $80 and sold for $70, how much per pound was lost?

1. How much will 7850 pounds of railroad iron cost at $ 17 a ton ?

2. At $ 2.25 per ton, how many pounds of coal can be bought for $ 22.50 ?

3. Find the value of 240 sacks of Peruvian guano, at $ 63 a ton, if each sack contains 150 pounds.

4. How many pounds of plaster can be bought for $ 17.25 at $ 5.75 a ton ?

5. If .75 of a ton of clover hay is worth $11.625, how much is 1 ton worth ?

6. A merchant bought goods for $ 840, and sold them for .15 more than he paid for them. How much did he receive for them ?

7. Find the cost of 12.9 yd. of cloth, if .25 of a yard costs $ 1.60.

8. At $ .125 a bar, how many bars of soap can be bought for $ 9.25 ?

9. If 2 bu. of oats cost $ .75, how many bushels can be bought for $ 27 ?

10. If $\frac{3}{5}$ of a piece of cloth is worth $ 97.50, how much is the other part worth ?

11. How much will 24,870 pounds of iron cost at $ 17.25 a ton ?

A **Bill** is a statement in detail of goods sold or delivered, or of services rendered. It shows the time, names of the parties concerned, the quantity, price, etc.

When a person buys anything for which he does not pay at the time, we say he goes in debt for it, and he is, therefore, called a **Debtor.**

When a person sells anything for which he does not receive pay at the time, he is said to give credit for it, and he is, therefore, called a **Creditor.**

A bill is **Receipted** when the creditor, or some one authorized to act for him, writes "Received Payment" or "Paid" at the bottom of the bill, and signs his name.

The following are a few of the abbreviations and symbols commonly used in bills and accounts :

@ . . . at.

Acct., % . . account.

Amt. . . . amount.

Bal. . . . balance.

Bbl. . . . barrel.

Co. . . . company.

Cr. . . . creditor.

Dr. . . . debtor.

Doz. . . . dozen.

Hhd. . . hogshead.

Mdse., merchandise.

No., # . . . number.

Pcs. . . . pieces.

Pay't . . payment.

Per . . . by.

Rec'd . . received.

CHICAGO, ILL., Sept. 30, 1897.

MR. JOHN H. PAYNE,

Bought of W. M. MILLER & CO.

8 bbl. Salt . . . . @ $1.30		10	40
140 lb. Crushed Sugar . . . " .11		15	40
28 Hams (340 lb.) . . . . . " .14		47	60
60 bu. Potatoes . . . . . . " .40		24	00
Received Payment,		$97	40

W. M. MILLER & CO.

PER BEERS.

Make out the following bills and receipt them, according to Form 1.

1. Miss E. L. Verlenden bought of Isaac Long, Philadelphia, Pa., Oct. 4, 1895: 28 yd. calico at 9¼¢; 6½ yd. velvet at $2; 1 doz. linen handkerchiefs at 37½¢ apiece; 4 pr. kid gloves at $1½; 2½ doz. buttons at 20¢; 9¾ yd. blk. silk at $2.40.

2. Daniel Jones bought of G. W. Summers, Cincinnati, O., May 30, 1897: 42 yd. muslin at 6½¢; 8 yd. flannel at 85¢; 4 yd. silk at $1.875; 22 yd. cashmere at $1.25; 9 yd. lace at 35¢; 25 yd. calico at 8¢; 6 pairs hose at 45¢; 28 yd. gingham at 12½¢.

Make out the following bill and receipt it, according to Form 1.

1. Harrington and Goodman, of Mobile, sold Charles Sauermilch, Oct. 5, 1895: 1 piece blk. mohair serge (28¼ yd.) at 36¢; 1 piece sateen (37¾ yd.) at 24¢; 1 piece Italian cloth (32 yd.) at $1.12½; 1 piece twilled lining (26½ yd.) at 16¢; 2 pieces silesia (57¼ yd.) at 16¢; 2 pieces canvas (83½ yd.) at 19¢.

<div align="center">Form 2</div>

<div align="right">PHILADELPHIA, Jan. 1, 1898.</div>

MR. JACOB READ,

<div align="center">To JOHNSON AND SMITH, Dr.</div>

1897							
Oct.	7	*To 90 lb. Dried Apples* . .	@	*$.11½*	10	35
Nov.	20	*To 100 lb. Codfish* . . .	"	*.06¼*	6	25
Dec.	10	*To 18 gal. Sirup*	"	*.87½*	15	75
		Received Payment,			*$32*	*35*

<div align="center">JOHNSON AND SMITH.</div>

2. William Stewart bought of W. M. Miller, Philadelphia, Pa.:

June 30, 1897: 21 sacks flour at 70¢; 60 lb. Mocha coffee at 30¢.

July 3, 60 lb. Java coffee at 35¢.

July 9, 15 lb. lard at 13¢; 18 lb. ham at 11¼¢.

Aug. 12, 16 lb. cheese at 14¢; 20 lb. sugar at 5¾¢.

Make out and receipt the following bills, according to Form 2, dating bills Jan. 1, 1898.

1. Wilson J. Smith bought of Bright and Harris of San Francisco, Cal.:

Oct. 7, 1897: 3760 ft. white pine boards, at $48 per M; 4350 shingles, No. 1, at $8 per M.

Nov. 19, 7620 ft. hemlock plank, at $11 per M; 6342 ft. white pine siding, at $38 per M.

Dec. 31, 128 chestnut fence posts, at $18 per C; 8760 ft. yellow pine flooring, at $22 per M; 3460 fence pickets, at 85¢ per C.

2. William Puckey bought of the American Book Co., New York:

Sept. 2, 1897: 250 Robinson's New Practical Arith., at 65¢; 400 Barnes's Fifth Reader, at 90¢.

Oct. 9, 500 Barnes's Fourth Reader, at 70¢; 600 Barnes's Third Reader, at 50¢; 600 Barnes's Second Reader, at 35¢.

Nov. 13, 600 Barnes's First Reader, at 20¢; 500 Jepson's Music Reader, No. 3, at 50¢.

3. Shepherd and Monks bought of Sturdevant and Goff, Pittston, Pa.:

Oct. 30, 1897: 2360 ft. hemlock at $13.25 per M; 7240 ft. yellow pine at $23.50 per M.

Dec. 12, 4650 ft. clear white pine at $45 per M.

An **Account Current** is a detailed record of un-
settled business transactions, embracing both debits
and credits. It shows the place and date of each
transaction, the items bought and sold, or services
rendered, together with quantity, price, etc.

Form 1

BUFFALO, N.Y., Jan. 1, 1898.

HENRY BADDERS,

In Account with STEVENS & CO. *Dr.*

1897							
Sept.	*11*	*To 4 tubs Butter (224 lb.), @ $ .22*	*49*	*28*			
"	*18*	*" 28 bu. Meal, " .80*	*22*	*40*			
Oct.	*17*	*" 5 bbl. Potatoes, " 1.50*	*7*	*50*	*79*	*18*	
		Cr.					
Sept.	*16*	*By 5 tons Coal, @ $2.40*	*12*	*00*			
Oct.	*22*	*" 1 day's Work with team*	*3*	*00*			
Dec.	*19*	*" 2 loads Kindling Wood at . 1.30*	*2*	*60*	*17*	*60*	
		Bal. due Stevens & Co.,				*61*	*58*

Balance the following account:

July 1, 1897, Daniel Frantz bought of J. D. Singer,
Baltimore, Md.: 5 doz. men's hats at $ 23 per doz.
July 15, 30 coats at $ 5.75.

July 29, Frantz sold Singer 110 bu. wheat at 80 ¢.
Aug. 1, 120 bu. corn at 40 ¢. *Aug. 12*, 140 bu. oats
at 35 ¢.

Arrange according to Form 1, Lesson 121, the following business transactions. Date the first account April 1, 1898, and the second Oct. 1, 1897.

1. *Jan. 1, 1898.* Myron Jones of Williamstown, Ohio, sold E. C. Williams 18½ lb. granulated sugar at 6 ¢; 7½ lb. coffee at 30 ¢; 3½ lb. tea at 80 ¢.

Feb. 5. Williams bought of Jones 8 gal. coal oil at 20 ¢; 3½ lb. cheese at 14 ¢; 1 pr. boots at $ 3.25.

March 21. Williams delivered Jones 10 bu. potatoes at 45 ¢; 7½ doz. eggs at 14 ¢; 25½ lb. dried apples at 10 ¢; and bought of him 14½ yd. calico at 8 ¢; 1 box yeast powder at 16 ¢.

March 27. Williams delivered Jones 12½ bu. wheat at 75 ¢; 3 bu. turnips at 30 ¢; 36½ lb. butter at 25 ¢; 1 barrel cider at $ 2.75; and bought of him 1 sack salt at 10 ¢; 2 cans salmon at 20 ¢; 2½ gal. sirup at 36 ¢, and 1 box starch at 25 ¢.

2. Ira Marvin bought of Kent, Lowber, & Co., New York:

July 1, 1897. 25 boxes lemons at $ 3.75; 45 boxes oranges at $ 4.25.

Aug. 3. 50 bbl. apples at $ 2.75; 10 sacks Java coffee at $ 16.80.

Aug. 17. 40 chests black tea at $ 28.75.

Aug. 12. Marvin paid on acct. $ 150.

Sept. 23. Marvin paid on acct. $ 325.

WRITTEN WORK

Form 2

STEWARTSTOWN, PA., Oct. 1, 1897.

JAMES A. GROVE,

In Acct. with FRANCIS WARD.

					Dr.		Cr.	
1897								
Jan.	*30*	*To 3 gal. Oil,*	*@*	*$ .90*	*2*	*70*		
Feb.	*7*	*To 5 lb. Soda,*	*"*	*.08*		*40*		
Feb.	*17*	*By 2 tons Coal,*	*"*	*3.00*			*6*	*00*
Mar.	*9*	*To 18½ bu. Wheat,*	*"*	*.90*	*16*	*65*		
April	*13*	*By Cash on %*					*5*	*00*
Oct.	*1*	*By Bal. due,*					*8*	*75*
		Rec'd Payment,			*$ 19*	*75*	*19*	*75*

Oct. 12, 1897.   FRANCIS WARD.

1. A farmer sold to a grocer at one time 50 bu. potatoes at 40¢, and at another time 60 bu. at 50¢, and took in payment at one time 40 lb. sugar at 5¢, 10½ lb. coffee at 30¢; and at another time 20 gal. molasses at 60¢. Supply names and dates, and find the balance due the farmer. (Use Form 2.)

2. W. R. Toomb bought of Fenton & Co., Chicago :

July 2, 1897.   120 pr. boys' thick boots at $ 1.37½.

July 11.   175 pr. boys' kip boots at $ 2.75.

July 21.   Toomb paid on acct. $ 150.

Oct. 9.   Toomb paid on acct. $ 150.

Date bill Jan. 1, 1898.   (Use Form 2.)

Arrange the following transactions according to Form 2, Lesson 123.

1. W. A. Powers, a contractor and builder, in acct. with Joseph Wilson, a lumber dealer of Boston, Mass.:

Jan. 9, 1898. Wilson sold Powers 2160 ft. hemlock boards, at $11 per M; 4260 ft. hemlock scantling, at $14 per M.

Jan. 26. Powers repaired barn for Wilson, for which Wilson credited Powers on acct. $21.75.

Feb. 9. Powers delivered Wilson a walnut office table, for which Wilson agreed to pay $7.50.

March 1. Powers paid Wilson on acct. $15. Find bal. April 1, 1898.

2. S. J. Downs, a miller, in acct. with R. S. Robbins, a merchant of Detroit, Mich.:

Jan. 1, 1898. Downs bought of Robbins $6\frac{1}{4}$ yd. muslin, at $8\cancel{c}$; $16\frac{1}{2}$ yd. alpaca, at $75\cancel{c}$; 1 pr. men's boots, at $2.75.

Jan. 12. Robbins sold Downs 45 lb. sugar, at $5\frac{1}{4}\cancel{c}$; $\frac{1}{2}$ doz. linen handkerchiefs, at $35\cancel{c}$.

Jan. 21. Downs bought of Robbins 38 bu. wheat, at $87\frac{1}{2}\cancel{c}$; $26\frac{1}{4}$ bu. rye, at $65\cancel{c}$; 80 bu. oats, at $35\cancel{c}$.

Jan. 30. Downs paid Robbins $30 on acct.

Arrange the preceding account according to Form 1, Lesson 121. Show balance Jan. 30, 1898.

Long Measure

12 inches = 1 foot
3 feet = 1 yard
16½ feet = 1 rod
5½ yards = 1 rod
320 rods = 1 mile

Square Measure

144 square in. = 1 square ft.
9 square ft. = 1 square yd.
272¼ square ft. = 1 square rd.
30¼ square yd. = 1 square rd.
160 square rd. = 1 A.

The following denominations are sometimes used in long measure:

4 inches = 1 hand
9 inches = 1 span
3 feet = 1 pace

6 feet = 1 fathom
5 paces = 1 rod
3 miles = 1 league

Liquid Measure

4 gills = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon

Dry Measure

2 pints = 1 quart
8 quarts = 1 peck
4 pecks = 1 bushel

Avoirdupois Weight

16 ounces = 1 pound
100 pounds = 1 cwt.
2000 pounds = 1 ton
20 cwt. = 1 ton

Time

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
12 months = 1 year

Counting

12 units = 1 dozen
12 dozen = 1 gross
20 units = 1 score

Paper

24 sheets = 1 quire
20 quires = 1 ream
10 reams = 1 bale

Linear or **Long Measure** is applied in estimating dimensions, distances, etc.

Reduce 4 rd. 2 yd. 2 ft. 7 in. to inches.

OPERATION

rd.	yd.	ft.	in.

In 4 rd. there are $4 \times 5\frac{1}{2}$ yd., or 22 yd. Adding the 2 yd., we get 24 yd. In 24 yd. there are 72 ft. Adding the 2 ft., we get 74 ft. In 74 ft. there are 888 in. Adding the 7 in., we get 895 in., the answer.

$$
\begin{array}{llll}
4 & 2 & 2 & 7 \\
5\frac{1}{2} \\
\hline
24 \text{ yd.} \\
3 \\
\hline
74 \text{ ft.} \\
12 \\
\hline
895 \text{ in., } Ans.
\end{array}
$$

Reduce:

	a.	*b.*
1.	4 rd. 2 yd. to inches.	140 rd. to yards.
2.	1 mi. 80 rd. to yards.	16 rd. 2 yd. 1 ft. to feet.
3.	2 mi. 160 rd. to yards.	5 rd. to feet.
4.	28 yd. 2 ft. to inches.	4.5 yd. to feet.
5.	16 yd. 9 in. to inches.	$1\frac{1}{2}$ mi. to rods.
6.	2 mi. to yards.	$1\frac{1}{8}$ mi. to yards.

7. 5 rd. 3 yd. 1 ft. 8 in. to inches.

8. 6 rd. 4 yd. 9 in. to inches.

9. 20 rd. 4 yd. 2 ft. to inches.

10. 24 rd. 12 ft. 11 in. to inches.

Reduce:

1. 3 sq. yd. 4 sq. ft. to square feet.

2. 2 sq. rd. 14 sq. yd. to square yards.

3. 2 sq. rd. 8 sq. yd. to square inches.

4. 2 gal. 2 qt. 1 pt. to pints.

5. 7 qt. 1 pt. 2 gi. to gills.

6. 2 bu. 2 pk. 5 qt. to quarts.

7. 4 bu. 7 qt. 1 pt. to pints.

8. 12 lb. 11 oz. to ounces.

9. 5 cwt. 75 lb. to pounds.

10. 8 T. 4 cwt. to pounds.

11. 2.5 A. to square rods.

12. $\frac{3}{8}$ mi. 40 rd. to rods.

13. 8 hr. 20 min. 14 sec. to seconds.

14. 9 da. 18 hr. to hours.

15. $2\frac{3}{4}$ gross to dozens.

16. $5\frac{3}{8}$ quires to sheets.

17. 2 bales 4 reams to quires.

18. 7.25 T. 7 cwt. to pounds.

19. $\frac{3}{4}$ mi. 220 rd. 14 ft. to feet.

20. $\frac{2}{3}$ da. 16 hr. 40 min. to minutes.

Change 928 in. to rd. yd., etc.

Dividing 928 by 12 to change to feet, we get 77 ft. and 4 in. over. Dividing 77 by 3 to change to yards, we get 25 yd. and 2 ft. over. Dividing 25 by 5½ to change to rods, we get 4 rd. and 3 yd. over.

OPERATION

12	928 in.
3	77 ft. 4 in.
5½	25 yd. 2 ft.
	4 rd. 3 yd.

Ans. = 4 rd. 3 yd. 2 ft. 4 in.

1. 763 in. equal how many rd. yd., etc.?

2. 8460 in. equal how many rd. yd., etc.?

3. 8570 ft. equal how many mi. rd., etc.?

4. 2600 sq. in. equal how many sq. yd., etc.?

5. 476 pt. equal how many bu. pk., etc.?

6. 8760 lb. equal how many T. cwt., etc.?

7. 7864 min. equal how many da. hr., etc.?

8. 876 sq. rd. equal how many A. sq. rd., etc.?

9. 324 pt. equal how many gal. qt., etc.?

10. 3592 yd. equal how many mi. rd., etc.?

11. 27,072 qt. equal how many bu.?

12. 157,540 min. equal how many wk. da., etc.?

13. 201,458 in. equal how many mi. rd., etc.?

Add 3 mi. 7 rd. 3 yd. 1 ft. 6 in., 2 mi. 6 rd. 4 yd. 1 ft. 9 in., and 6 mi. 3 rd. 5 yd. 2 ft. 8 in.

Adding the column of inches, we get 23 in., which = 1 ft. 11 in. Writing the 11 in. under the column of inches, and carrying the 1 ft. to the column of feet,

OPERATION

mi.	rd.	yd.	ft.	in.
3	7	3	1	6
2	6	4	1	9
6	3	5	2	8
11	18	2	2	11, *Ans.*

and adding, we get 5 ft., which = 1 yd. 2 ft. Writing the 2 ft. under the column of feet, and carrying the 1 yd. to the column of yards, and adding, we get 13 yd., which = 2 rd. 2 yd. Writing the 2 yd. under the column of yards, and carrying the 2 rd. to the column of rods, and adding, we get 18 rd. Adding the column of miles, we get 11 mi.

Add:

1.	mi.	rd.	yd.	ft.	in.
	4	29	3	1	7
	6	78	5	2	11
	7	36	4	1	8

2.	mi.	rd.	yd.	ft.	in.
	16	140	5	2	11
	21	260	4	1	7
	18	325	2	0	8

3.	mi.	rd.	yd.	ft.	in.
	7	6	5	2	8
	6	40	2	1	6
	9	38	4	2	7

4.	mi.	rd.	yd.	ft.	in.
	38	40	2	2	10
	76	150	5	1	9
		160	4	2	3

WRITTEN WORK

Add :

	gal.	qt.	pt.			bu.	pk.	qt.	pt.			gal.	qt.	pt.
1.	8	3	1		2.	4	2	4	1		3.	7	3	0
	5	2	1			3	1	7	1			8	2	1
	7	3	1			5	3	2	0			4	0	1

	hr.	min.	sec.			wk.	da.	hr.			T.	lb.
4.	18	21	14		5.	4	3	8		6.	4	386
	9	45	28			3	4	16			5	1640
	17	30	40			5	6	21			7	1982

	bu.	pk.	qt.			yr.	mo.			sq. yd.	sq. ft.	sq. in.
7.	8	2	4		8.	14	9		9.	12	3	121
	7	3	2			6	7			7	7	142
	6	3	7			8	8			3	6	84

10. Add 3 wk. 5 da. 18 hr., 17 wk. 4 da., 8 wk. 16 hr., 2 wk. 6 da. 13 hr.

11. Add 46 mi. 120 rd. 2 yd. 2 ft., 21 mi. 240 rd. 1 yd. 1 ft. 9 in., 18 mi. 1 yd. 8 in.

12. Add 14 bu. 3 pk. 5 qt. 1 pt., 16 bu. 2 pk. 7 qt. 1 pt., 8 bu. 6 qt. 1 pt.

13. Add 21 lb. 14 oz., 16 lb. 9 oz., 8 lb. 7 oz., 6 lb. 12 oz.

14. Add 56 gal. 3 qt. 1 pt. 2 gi., 78 gal. 2 qt. 1 pt., 85 gal. 1 qt. 1 pt. 3 gi., 96 gal. 2 qt. 1 pt. 2 gi., 140 gal. 1 qt. 1 gi., 37 gal. 3 qt. 1 pt. 3 gi., 37 gal. 3 qt. 1 pt. 3 gi.

From 21 mi. 125 rd. 5 yd. 1 ft. 9 in., subtract 10 mi. 136 rd. 2 yd. 2 ft. 7 in.

Beginning at in. to subtract, we proceed as follows: 7 in. from 9 in. = 2 in., which we write under the column of inches.

OPERATION

mi.	rd.	yd.	ft.	in.
21	125	5	1	9
10	136	2	2	7
10	309	2	2	2, *Ans.*

Since 2 ft. cannot be taken from 1 ft., we take 1 yd. from 5 yd., leaving 4 yd. 1 yd. = 3 ft., which added to 1 ft. = 4 ft. 2 ft. from 4 ft. = 2 ft., which we write under feet. ·2 yd. from 4 yd. = 2 yd. Since 136 rd. cannot be taken from 125 rd., we take 1 mi. from 21 mi., leaving 20 mi. 1 mi. = 320 rd., which added to 125 rd. = 445 rd. 136 rd. from 445 rd. = 309 rd., which we write under rods. 10 mi. from 20 mi. = 10 mi.

Subtract:

	rd.	ft.	in.			rd.	yd.	ft.	in.			mi.	rd.	yd.
1.	29	8	7		2.	85	5	1	5		3.	49	38	4
	12	14	5			21	4	2	7			24	72	3

	bu.	pk.	qt.			gal.	qt.	pt.			wk.	da.	hr.
4.	24	2	5		5.	14	2	0		6.	24	3	12
	16	3	3			9	3	1			7	4	15

7. From 35 da. 10 hr. 40 min. take 16 da. 14 hr.

8. From 28 lb. 9 oz. take 17 lb. 14 oz.

Multiply 12 mi. 126 rd. 4 yd. by 3.

3 times 4 yd. = 12 yd., which

= 2 rd. 1 yd.   We write the 1 yd. under yards, and add the 2 rd. to the product of rods.   3 times 126 rd. = 378 rd., which added to the 2 rd. = 380 rd.   380 rd. = 1 mi. 60 rd.   We write the 60 rd. under rods, and add the 1 mi. to the product of miles.   3 times 12 mi. = 36 mi., which added to the 1 mi. = 37 mi.

OPERATION

mi.	rd.	yd.
12	126	4
		3
37	60	1, *Ans.*

Multiply:

	yd.	ft.	in.			bu.	pk.	qt.			gal.	qt.	pt.
1.	8	2	7		2.	7	3	5		3.	7	3	1
			4					6					7

Multiply:

a.

1. 4 wk. 3 da. 7 hr. by 5   21 yr. 7 mo. by 6

2. 12 hr. 14 min. 21 sec. by 3   7 sq. ft. 26 sq. in. by 6

3. 21 mi. 160 rd. 3 yd. by 5   14 gal. 1 pt. by 9

4. 64 lb. 13 oz. by 7   14 T. 360 lb. by 8

5. 17 yd. 2 ft. 8 in. by 8   18 qt. 1 pt. by 12

Divide 25 bu. 3 pk. 7 qt. by 3.

OPERATION   Dividing 25 bu. by 3, we get

bu. pt. qt.   8 bu. and 1 bu. remainder. 1 bu.

3)25 3 7   = 4 pk., which added to the

  8 2 5, *Ans.* 3 pk. = 7 pk. Dividing 7 pk. by

3, we get 2 pk. and 1 pk. remainder. 1 pk. = 8 qt., which added to the 7 qt. = 15 qt. Dividing 15 qt. by 3, we get 5 qt.

Divide :

          a.   *b.*

1. 66 yd. 2 ft. by 4   22 hr. 26 min. 6 sec. by 7

2. 18 bu. 1 pk. 1 qt. by 5   65 T. 1680 lb. by 8

3. 34 gal. 1 qt. 1 pt. by 5   70 yd. 2 ft. 3 in. by 9

4. Find the cost of 128 pt. of nuts at $1.92 a bu.

5. If my watch loses 5 min. 18 sec. daily, how much will it lose in 2 wk. ?

6. A boy picked 9 bu. 2 pk. 2 qt. of huckleberries in one week. How many bu., pk., and qt., on an average, did he pick each day ?

7. How many years and months are there from Feb. 1732 to Dec. 1799 ?

8. How many years, months (30 da.), and days are there from April 28, 1758, to July 4, 1831 ?

A **Line** is that which has length only.

A **Straight Line** is one that does not change its direction at any point.

A **Curved Line** is one that continually changes its direction.

Parallel Lines are those which run in the same direction.

When two straight lines are drawn from the same point, the opening between the lines is called an **Angle**.

When one straight line meets another straight line so as to form two equal angles, the lines are said to be **Perpendicular** to each other, and the angles thus formed are called **Right Angles**.

When the angle is less than a right angle, it is called an **Acute Angle**; when greater than a right angle, it is called an **Obtuse Angle**.

NOTE. — Pupils very frequently get an incorrect idea of an angle. They think the size of an angle depends upon the length of the lines rather than upon the opening between the lines. Most pupils will consider the first angle of each of the following couples the smaller; the teacher should make this matter clear.
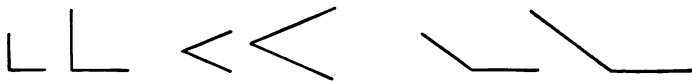
A **Surface** is that which has two dimensions only, *length* and *breadth*.

A **Rectangle** is a plane surface bounded by four straight lines, and having four right angles.

Rectangle

A **Square** is a rectangle whose four sides are of equal length.
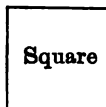
Square

The **Area** of a surface is the number of square units of a certain value it contains, and is expressed by the product of two numbers representing its length and breadth.

If we suppose the rectangle *ABCD* to be 3 feet long and 2 feet wide, the unit of measure will be the **Square Foot**. If the rectangle is divided by lines as represented in the illus-tration, it will be found to contain 2 times 3, or 6, *square feet*.

ILLUSTRATION
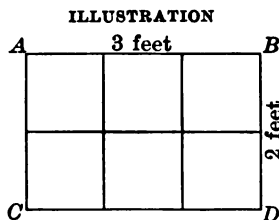
1. Show by a drawing that a 4-inch square contains 16 sq. inches.

2. Show by a drawing that a rectangle 5 feet long and 4 feet wide contains 20 sq. feet.

3. Show by a drawing that the top of a table that is 3 ft. long and 24 in. wide contains 6 sq. ft.

Since the product of the length and breadth of a rectangle equals its area, either side will equal the area divided by the other side.

1. How many square inches of surface are there in a rectangle 16 in. long and 13 in. wide?

2. A blackboard 10 ft. long has a surface of 40 sq. ft. What is the width of the board?

3. How many square feet of surface are there in a floor 18 ft. long and 16 ft. wide?

4. A room 16 ft. long has a surface of 192 sq. ft. What is the width of the room?

5. Ingrain carpet is 1 yard wide. How many yards will be required to cover a hall 24 ft. long and 9 ft. wide?

6. How many square yards are there in the four walls of a room 18 ft. long, 15 ft. wide, and 9 ft. high?

7. How many sq. rd. are there in a piece of land 20 rd. square?

8. A piece of land 80 rd. long and 40 rd. wide contains how many acres?

9. A floor 18 ft. long requires 30 sq. yards of carpet. Find the width of the room.

1. A rectangular field containing 40 acres is 50 rd. wide. How many rods of fence will be required to inclose the field?

2. How many square yards of surface are contained in the walls and ceiling of a room 48 ft. long, 45 ft. wide, and 15 ft. high?

3. How many yards of carpet, 1 yd. wide, will be required to cover the floor of the room described in Example 2?

15 ft.

One strip, 15 ft. long and $2\frac{1}{4}$ ft. wide

9 ft.
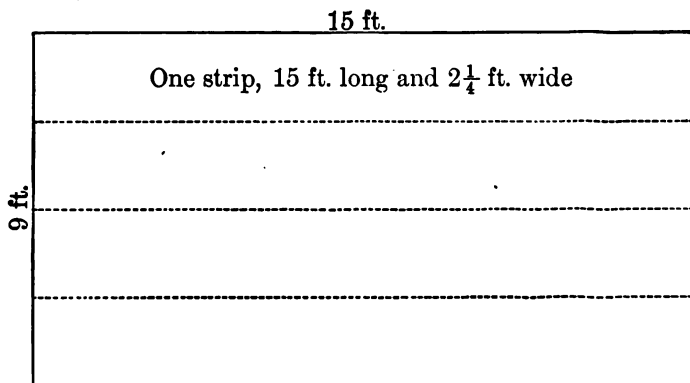
4. The above plan represents a room 15 ft. long and 9 ft. wide, covered with carpet $2\frac{1}{4}$ ft. wide. How many yards were required, and how much did it cost at $1.25 a yard?

5. How many yards of carpet 1 yd. wide, will be required to carpet a room that is 21 ft. square.

I. WRITTEN WORK

1. How many yards of Brussels carpet, $\frac{3}{4}$ yd. wide, will cover the floor of a room 18 ft. long and $13\frac{1}{2}$ ft. wide, the carpet to run lengthwise?

2. How much will it cost to plaster the walls and ceiling of a room 21 ft. long, 18 ft. wide, and 15 ft. high, at 40¢ a square yard?

II. WRITTEN WORK

A **Triangle** is a plane surface, as ABC, bounded by three straight lines. Any side, as AB, may be called the **Base,** and the shortest distance, as AC,

from the base to the opposite corner is the **Perpendicular** or **Altitude.**
If AC were considered the base, AB would be the alt.; and if BC were the base, AE would be the alt.
The triangle ABC is one half of the rectangle $ABCD$. *Hence the area of a triangle is one half the area of a rectangle having the same base and altitude, or one half the product of the base and altitude.*
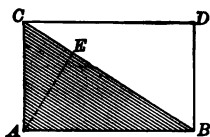
1. How many square feet are there in a piece of land 44 ft. long and 28 ft. wide?

2. How many square feet are there in a triangular piece of land whose base is 44 ft. and altitude 28 ft.?

1. Find the area of a triangle whose base is 160 ft. and altitude 100 ft.

2. Find the area of a triangle whose base is 12 yd. and altitude 1 rd.

3. How many square rods are there in a rectangular piece of land that is 40 rods long and 28 rods wide?

4. How many acres are there in a triangular piece of land whose base is 40 rods and altitude 28 rods?

A plane surface bounded by four straight lines is called a **Quadrilateral**.

Quadrilaterals having their opposite sides parallel are called **Parallelograms**.

Parallelograms {
　Rectangle.
　Square.
　Rhomboid.
　Rhombus.
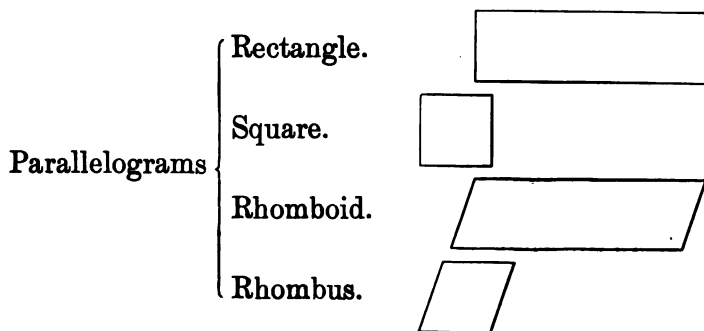
The area of a parallelogram equals the product of its length and width.

1. Find the area of a rhomboid whose length is 35 ft. and width 26 ft.

2. Find the area of a rhombus whose length is 24 ft. and width 20 ft.

A quadrilateral which has only two of its sides parallel is called a **Trapezoid.**
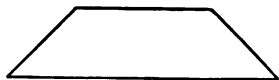
The area of a trapezoid is found by multiplying one half of the sum of its parallel sides by its width.

3. Find the area of the following figures:

Fig. 1   Fig. 2   Fig. 3   Fig. 4

$12\frac{1}{2}$ ft.   10 ft. $12\frac{1}{2}$ ft.   15 ft. $12\frac{1}{2}$ ft.   25 ft. $12\frac{1}{2}$ ft.   13 ft.

Fig. 5   Fig. 6   Fig. 7

10 ft. $12\frac{1}{2}$ ft.   25 ft.   16 ft.   12 ft.   24 ft.   24 ft.   8 ft.   12 ft.   32 ft.
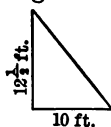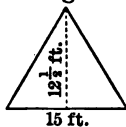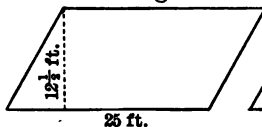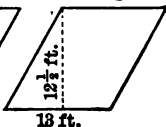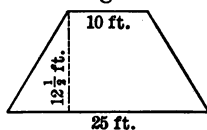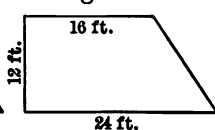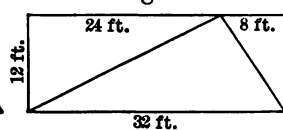
4. Show that the sum of the areas of the three triangles composing Fig. 7 equals the area of the rectangle.

ANSWERS

Page 5, Ex. II—1 1,469,669 2 4,945,009
Page 6, Ex. III—1 15,511 2 15,708 3 11,892 4 26,387

	a	b	c		a	b	c
Ex. IV—1	111	1569	1680	3	511	1221	1
2	109	1138	489				

Page 7, Ex. III—1 $1109.92 2 $960.03 3 $941.56 4 $2532.18

	a	b	c	d
Ex. IV—1	1694	13,664	11,223	23,808
2	9074	24,209	24,864	49,368
3	13,122	27,588	55,699	34,539

	a	b	a	b	a	b
Page 8, Ex. III—1	14,417	14,328	2 19,483	42,164	3 70,358	27,762

	a	b	c	d
Page 9, Ex. I—1	26	242	311	123
2	22	224	231	143
3	42	426	122	107
4	24	422	202	103

Ex. II—1 $16.20 2 $55 3 $82.50 4 $559.56 5 $36 6 1600 lb.
7 14¢ 8 $1.60 ; $2.40

	a	b	c	d
Page 11, Ex. I—1	$67.68	$110.48	$1099.20	$17,041.60
2	$73.84	$136.48	$2118.32	$11,785.28
3	$72.64	$291.36	$3890.96	$15,509.76
4	$84.56	$219.12	$5856.72	$13,099.44

	a	b		a	b
Ex. II—1	$9.72	$40.86	4	$10.16	$61.30
2	$45.73	$82.21	5	$34.27	$17.25
3	$10.90	$25.64			

	a	b	c		a	b	c
Ex. III—1	$23	21	$111	4	23	$.21	111
2	$.23	21	11,100	5	2300	$21	111
3	23	2100	$1.11				

6 $31; $.31; $93; $.93; $9.30 7 $387; $3.87; $38.70; $426
Page 13, Ex. I—1 $2590.72 2 $1688.26 3 $16,899.24 4 $18,880.17
Ex. II— $287.15
Ex. III—1 $6316.21 2 321; 564; 738; 1006; 1896; 262
Page 14—1 $24 2 $3.24 3 $58.80 4 $1680 5 $360 6 96 da.
7 $7.84 8 $388.80 9 $2.52 10 $68.75 11 $1.99
Page 16, Ex. I—

	a	b	c		a	b	c
1	$1073\frac{41}{?}$	$998\frac{44}{?}$	$10,169\frac{44}{?}$	3	$1771\frac{11}{?}$	$568\frac{5}{57}$	$10,893\frac{44}{?}$
2	$1549\frac{3}{47}$	$2669\frac{1}{47}$	$4296\frac{5}{53}$	4	$546\frac{4}{5}$	$945\frac{11}{15}$	$8326\frac{7}{57}$

146 ANSWERS

Ex. II—1 354,678 2 485,763 3 3,498,765
Ex. III—1 11 ft. 11 in. 2 22 hr. 3 41 yd. 2 ft. 4 38 gal.
Page 17, Ex. I—1 $161.44
Page 18—1 $347.50 2 $2 3 290 bbl. 4 $15.72 5 $2146 6 $42
7 38¢ 8 75¢ 9 36 sq. yd.
Page 19—1 $1700 2 $121.20 3 $13.90 4 $412.50 5 10 hr. 45 min.
6 $6.48 7 62½¢ 8 $527 9 $208.50
Page 22—1 1,800,079 2 16,707,310 3 940,228 4 346,357
5 177,386 6 1,980,921,922 7 1,528,941
Page 23, Ex. I—1 15,026,848 2 137,859,306 3 1,517,595,549
Ex. II—1 $430,277.30 2 $1,572,034,780.48 3 $170,757.78

	a	b	a	b
Page 24, Ex. I—1	527,821	619,902 rd.	**3** $4013.97	461,056 T.
2	$2594.86	126,033 ft.		

	a	b	c	a	b	c
Ex. II—1	6480	237,440	$168,480	**4** 41,510	328,100	$4425.20
2	30,720	274,160	$3820.80	**5** 61,560	829,080	$837,810
3	52,320	728,520	$560,790			

Ex. III—1 985,600 yd. 2 4,118,400 ft. 3 2,106,240 hr.
4 35,481,600 in.

	a	b	c
Page 25, Ex. I—1	3,060,144	60,746,100	6,848,780,208
2	2,938,628	81,329,696	1,670,889,184
3	3,219,360	55,090,854	8,149,433,316
4	4,728,528	79,214,944	4,376,515,696
5	5,316,597	30,431,638	5,724,492,356

Ex. II—1 $13,198.16 2 $4257.50 3 $750
Page 26, Ex. I—1 $295.94
Ex. II—1 $73,427.50 2 $592.41 3 $3546.21 4 $12,636.75
5 $4463.93 6 $42,497.21
Page 27—1 6,213,704 2 $5,993,256 3 $10,112.72 4 $31,000
5 B, $40,045 ; C, $4345 6 $24.50 gain 7 676

	a	b		a	b
Page 28, Ex. I—1	146	$1325\frac{74}{127}$	**Ex. II**—1	$2912\frac{449}{148}$	2409
2	$153\frac{9}{23}$	$1725\frac{10}{165}$	2	$2004\frac{114}{147}$	1200
3	$133\frac{17}{57}$	$1811\frac{28}{181}$	3	$1183\frac{362}{161}$	1621
4	694	$1653\frac{62}{761}$	4	$1023\frac{1129}{1129}$	2839
5	$887\frac{74}{42}$	$1609\frac{321}{241}$	5	$10,143\frac{7117}{1301}$	6171

	a	b		a	b
Ex. III—1	$1736\frac{65}{76}$ ft.	735,800	4	$832\frac{34}{152}$ bbl.	5246
2	$2032\frac{49}{80}$ in.	815,400	5	$709\frac{124}{124}$ yd.	$6475
3	$5166\frac{84}{125}$ mi.	5283	6	$1329\frac{242}{242}$	$8167

Page 29—1 4756 A. 2 300 3 868 4 195 5 64 6 84 mi.
7 313 da. 8 $126 9 85 mi. 10 $95 11 24¢
Page 30—1 $42 2 $7011 3 2240 lb. 4 5280 ft. 5 $80 6 280
7 $19 8 2400 qt. 9 2300 gal. 10 15,000 yd. 11 $16

Page 31 — 1 2500 lb.   2 20,400 bu.   3 800 lb.   4 50,200 bu.
5 2050 bu.   6 85¢   7 345   8 $41.65   9 1750 lb.   10 1540 qt.   11 3720 ;
5244   12 $1.85 ; 26

Page 32 — 2 $602.70   3 $70   4 $60.48   5 $7125   6 $1776.25

Page 33 — 1 78 da.   2 70 bbl.   3 189   4 274 A.   5 30   6 $1684.11
7 48   8 33¢   9 $63.75

Page 34 — 1 $142.29   2 $7   3 $4   4 $1.20   5 90¢   6 24 hr.
7 $3271.05   8 88 bu.

Page 35 — 1 1620 rd.   2 $2.65   3 24   4 9 da.   5 15 bbl.   6. 1500
7 702   8 2400 lb.   9. 84 lb.

Page 38, Ex. II — 1 49   2 65   3 64   4 60   5 54½   6 90½   7 150½
8 3½   9 10   10 8½   11 12½   12 7   13 15½   14 47½

	a	*b*		*a*	*b*
Ex. III —	1 13	37½		3 53½	44¼
	2 22½	82¼		4 79½	145½

	a	*b*	*c*	*d*		*a*	*b*	*c*	*d*
Page 40, Ex. I —	1 24½	101½	58	½	4 49	71	161	15½
	2 25	17	77	2	5 31	43½	199½	½
	3 26	62	78	7½	6 51	29	99	27

Page 41, Ex. I — 1 16   2 99¢   3 $2.75   4 25½ bu.   5 $1.40 ; $7.20
6 $10   7 56 ; 90 ; 140 ; 180

Ex. II — 1 $482½   2 $294.43   3 $599.93

Page 42 — 1 274½ lb.   2 $3   3 $7.08   4 $360   5 35 lb.   6 100
7 $16   8 $37½   9 $93½   10 $111½   11 174½ lb.   12 381½ yd.
13 92½ in.   14 96½ hr.   15 74½ pk.   16 100¢

Page 47, Ex. III — 2 40½   3 64⅝   4 47¾   5 100⅞   6 117½   7 86¼
8 65⅞   9 60⅞   10 88⅞   11 110¼

Page 48, Ex. I — 1 33   2 51½   3 51¼   5 56¼   6 65¼   7 18¼   9 17¼
10 27⅓   11 36¼

	a	*b*		*a*	*b*
Ex. II —	1 14	32½	**Ex. III** — 1 2	¼
	2 24¾	44⅔		2 2⅓	⅓
	3 67¼	21⅝		3 ⅞	⅜
	4 4⅝	59½		4 ¼	1⅜
	5 54¾	26¾		5 0	⅓

Page 50 — 1 99¼ hr.   2 26½ yd.   3 $39¾   4 1¾ yd.   5 1⅓ mi.
6 64¼ bu.   7 15½ gal.   8 13⅞ yd.   9 $67½

	a	*b*	*c*	*d*		*a*	*b*	*c*	*d*
Page 52, Ex. I —	1 339	602⅞	455¼	414¾	**Ex. II** — 1 135	238	511	476
	2 394	356½	254¼	668¼	2 185	305	450	276
	3 614	629	557⅞	653⅝	3 194	379	522	542

Ex. III — 1 $141½   2 104 bu. ; 135 bu. ; 182 bu.   3 $3 ; $36 ; $49½
4 9⅝¢   5 $12   6 345 in. ; 162 in.

Page 53, Ex. I — 1 ⁶⁵⁄₄ ; ²³⁸⁄₃   2 ¹¹²⁄₁ ; ²⁴⁷⁄₃   3 ¹⁷²⁄₃ ; ⁶⁷⁹⁄₂

Ex. II — 1 ¹⁷⁰⁄₁ ; ⁴⁷⁴⁄₃   2 ³⁶⁶⁄₃ ; ⁵¹⁸⁄₁   3 ¹⁸⁸⁄₁ ; ³³⁸⁄₃   4 ²⁸⁰⁄₁ ; ⁶⁸⁴⁄₁

Page 54, Ex. I — 1 $19.58   2 198\frac{1}{4}$

             a *b*   *a* *b*   *a* *b*

Ex. II — 1 $\frac{72}{?}$ 81   2 $\frac{67}{4}$ 63   3 $\frac{221}{4}$ 24   4 2 pr. ; 4 pr. ; 6 pr. ; 8 pr.
5 35   6 4 bbl.   7 $67

Page 55, Ex. I — 1 3 hr. ; 4 hr.   2 $33

Ex. II — 1 $19   2 150\frac{7}{8}$ 3 16$\frac{1}{2}$ lb.   4 214$\frac{1}{2}$ ft. ; 561 ft.   5 16\frac{1}{2}$;
$66   6 30 lb.

Page 56 — 1 68.82\frac{1}{2}$ 2 789.26\frac{2}{3}$ 3 2682.52\frac{5}{8}$ 4 275\frac{1}{4}$; 468\frac{3}{4}$
5 $75 ; 93\frac{3}{4}$ 6 3300 ft.   7 120 rd.   8 165 yd.   9 2 yd. ; 10 yd.
10 40 da.   11 13 pr.

           a   *b*   *c*   *a*   *b*   *c*

Page 60, Ex. I — 1 42$\frac{1}{5}$ 47$\frac{1}{5}$ 308   **Ex. II** — 1 20$\frac{1}{3}$ 33$\frac{1}{3}$ 19.52\frac{1}{2}$
               2 67$\frac{2}{5}$ 88$\frac{1}{2}$ 274$\frac{1}{4}$ 2 3$\frac{1}{4}$ 39$\frac{1}{4}$ 23.58\frac{1}{3}$
               3 123$\frac{3}{4}$ 113$\frac{1}{4}$ 415$\frac{1}{4}$ 3 16$\frac{1}{4}$ 29$\frac{1}{4}$ 31.99\frac{1}{4}$
                                              4 7$\frac{2}{3}$; 21$\frac{1}{3}$; 23$\frac{1}{3}$; 57$\frac{1}{2}$

Page 61, Ex. I — 1 53$\frac{1}{2}$ 2 130   3 71   4 94$\frac{1}{2}$ 5 160$\frac{2}{3}$ 6 265$\frac{3}{4}$ 7 119$\frac{5}{8}$
8 211$\frac{1}{4}$ 9 199$\frac{2}{3}$ 10 1851$\frac{3}{4}$

Ex. II — 1 49$\frac{3}{4}$ 2 26$\frac{1}{4}$ 3 60$\frac{1}{4}$ 4 26$\frac{1}{4}$ 5 27$\frac{1}{4}$ 6 5$\frac{1}{8}$ 7 55$\frac{1}{4}$ 8 33$\frac{1}{4}$
9 65$\frac{1}{8}$ 10 8$\frac{1}{8}$

           a   *b*   *c*   *a*   *b*   *c*

Ex. III — 1 21   421$\frac{1}{2}$ $\frac{1}{3}$ 4 29$\frac{1}{4}$ 41$\frac{1}{4}$ $\frac{1}{5}$
          2 98$\frac{2}{3}$ 145$\frac{1}{4}$ $\frac{1}{5}$ 5 23$\frac{1}{8}$ 161$\frac{1}{4}$ $\frac{3}{4}$
          3 61$\frac{1}{2}$ 213$\frac{1}{4}$ 2

Page 62 — 1 133$\frac{1}{3}$ lb. ; 258 lb.   2 9$\frac{1}{2}$ yd.   3 3\frac{1}{4}$; 66\frac{2}{3}$ 4 43$\frac{1}{2}$¢
5 144 in.   6 10\frac{1}{4}$ 7 165 min.   8 $1.80   9 28$\frac{1}{2}$ ft.   10 77$\frac{1}{4}$ bu.
11 $1.15

             a   *b*   *a*   *b*

Page 64, Ex. I — 1 60$\frac{2}{3}$ 69\frac{1}{4}$ 4 142$\frac{1}{4}$ 30.66\frac{1}{4}$
            2 80 122\frac{1}{2}$ 5 149$\frac{1}{4}$ 45.34\frac{1}{4}$
            3 77$\frac{1}{2}$ 37.66\frac{2}{3}$

             a *b* *c*   *a* *b* *c*

Ex. II — 1 12   24   72   3 30   6   8
         2 27   24   15

             a *b*   *a* *b*

Page 65, Ex. I — 1 2   51   4 21   18
         2 39   9   5 10   24
         3 15   9

Ex. II — 1 10   2 30   3 30   4 30   5 40   6 10

             a   *b*   *a*   *b*

Page 66, Ex. I — 1 13.12\frac{1}{2}$ 23.33\frac{1}{3}$ 4 11.66\frac{2}{3}$ 30.62\frac{1}{2}$
            2 5.83\frac{1}{3}$ 4.37\frac{1}{2}$ 5 2.18\frac{3}{4}$ 29.16\frac{2}{3}$
            3 21.87\frac{1}{2}$ 2.91\frac{3}{4}$

Ex. II — 1 26\frac{1}{4}$; 28\frac{1}{4}$ 2 57\frac{1}{4}$; 18\frac{1}{4}$ 3 $36 ; $12   4 $9 ; 56\frac{7}{8}$
5 $42 ; 10\frac{1}{2}$

Ex. III — 1 20   2 72 bbl. ; 30 bbl.   3 15 T. ; 45 T.

Page 67, Ex. I—1 18 T. **2** 24 cwt. **3** 120 yd. **4** 16 **5** 48 T.
Ex. II—1 39 doz. **2** 21 wk. **3** 9 bbl. **4** 51 **5** 17 bu. **6** 13 lb.
Page 68, Ex. I—1 30 pr. **2** 30 doz. **3** 40 doz. **4** 30
Ex. II—1 96 lb. **2** 168 bu. **3** 256 gal. **4** 160 bu. **5** 162
Page 69, Ex. I—1 60 ; 644 **2** 144 **3** 632 lb. **4** 200 yd.
Ex. II—1 2.82\frac{1}{2}$ **2** 60¢ **3** 23\frac{1}{2}$ **4** $1.80 **5** 2.02\frac{1}{2}$
Page 70, Ex. I—2 6$\frac{1}{2}$ **3** 18$\frac{1}{4}$ **4** 32$\frac{1}{4}$ **5** 15$\frac{1}{4}$ **6** 4$\frac{2}{3}$ **8** 20$\frac{1}{4}$ **9** 26$\frac{1}{4}$
10 23$\frac{7}{8}$ **11** 47$\frac{1}{2}$ **12** 387$\frac{7}{8}$ **13** 93$\frac{1}{3}$ **14** 99$\frac{1}{2}$ **15** 441$\frac{1}{2}$ **16** 10$\frac{1}{4}$ **17** 295$\frac{1}{2}$
Ex. II—1 35$\frac{1}{3}$ **2** 47$\frac{1}{4}$ **3** 80$\frac{1}{4}$ **4** 196$\frac{1}{4}$ **5** 178$\frac{1}{4}$ **6** 192 **7** 184$\frac{2}{3}$
8 179$\frac{1}{4}$ **9** 197 **10** 167$\frac{1}{2}$ **11** 134$\frac{1}{3}$ **12** 113$\frac{1}{4}$

	a	b	c		a	b	c
Page 71, Ex. I—1	48$\frac{5}{8}$	27$\frac{1}{4}$	72	**4**	21	12	30
2	112	5	44$\frac{1}{4}$	**5**	48	87$\frac{1}{2}$	20
3	6$\frac{1}{4}$	283$\frac{1}{2}$	4\frac{1}{2}$				

Page 72—1 $\frac{1}{4}$ **2** $\frac{1}{3}$; 12¢ **3** $32 **4** 24 hr. ; 20 hr. ; 21 hr. ; 16 hr.
5 42 mi. **6** $24 **7** $400 **8** 60 lb. **9** 240 in.

	a	b	c		a	b	c
Page 78, Ex. I—1	37$\frac{5}{12}$	63$\frac{1}{2}$	108$\frac{5}{8}$	**3**	42$\frac{1}{4}$	86$\frac{1}{4}$	135$\frac{1}{4}$
2	41$\frac{1}{4}$	68$\frac{5}{12}$	55$\frac{2}{3}$				

		a	b	c		a	b	c
Ex. II—	**1**	7$\frac{1}{2}$	19$\frac{1}{8}$	29$\frac{1}{8}$	**4**	30$\frac{1}{2}$	5$\frac{1}{4}$	37$\frac{1}{4}$
	2	17$\frac{1}{4}$	26$\frac{7}{12}$	48$\frac{7}{8}$	**5**	8$\frac{5}{12}$	11$\frac{7}{12}$	18$\frac{1}{4}$
	3	16$\frac{11}{12}$	7$\frac{2}{3}$	37$\frac{1}{4}$	**6**	23$\frac{11}{12}$	9$\frac{5}{12}$	28$\frac{5}{8}$

	a	b		a	b
Page 79, Ex. I—1	24$\frac{4}{8}$	49.04\frac{7}{8}$	**3**	11$\frac{11}{12}$	128.04\frac{5}{12}$
2	18$\frac{1}{4}$	68.36\frac{1}{4}$			

Ex. II—1 76$\frac{1}{4}$ **2** 61$\frac{1}{4}$ **3** 124$\frac{2}{3}$ **4** 128$\frac{1}{4}$ **5** 84$\frac{11}{12}$ **6.** 158$\frac{1}{12}$ **7** 74$\frac{3}{4}$
8 165$\frac{7}{8}$ **9** 202$\frac{11}{12}$ **10** 162$\frac{7}{12}$ **11** 110$\frac{11}{12}$ **12** 76$\frac{1}{4}$ **13** 211$\frac{1}{4}$ **14** 118$\frac{7}{12}$
15 133$\frac{11}{12}$ **16** 165 **17** 175$\frac{11}{12}$ **18** 106$\frac{1}{12}$
Page 80, Ex. I—1 24$\frac{1}{8}$ **2** 4$\frac{7}{12}$ **3** 26$\frac{11}{12}$ **4** 37$\frac{1}{2}$ **5** 28$\frac{5}{8}$ **6** 14$\frac{1}{4}$ **7** 8$\frac{5}{8}$
8 16$\frac{2}{3}$ **9** 37$\frac{1}{12}$ **10** 18$\frac{5}{12}$ **11** 18$\frac{7}{12}$ **12** 4$\frac{4}{8}$

		a	b		a	b
Ex. II—	**1**	14$\frac{1}{4}$	68$\frac{11}{12}$	**4**	67$\frac{1}{12}$	157
	2	34	107$\frac{7}{8}$	**5**	92	14$\frac{1}{4}$
	3	74$\frac{5}{12}$	57$\frac{1}{4}$			

Ex. III—1 82 ; 195 in. **2** 88 in. ; 115 in. **3** 134 hr. ; 30$\frac{1}{4}$ doz.
4 77 in. **5** 3$\frac{5}{12}$¢
Page 81—1 89 mo. ; 103 mo. ; 47 mo. **2** 60$\frac{7}{12}$ bu. **3** 106$\frac{11}{12}$ bu.
4 79 in. ; 11$\frac{1}{4}$ in. **5** 13$\frac{1}{8}$ yd. **6** 273$\frac{1}{4}$ doz. **7** 19$\frac{11}{12}$ yd. **8** 36 min.
9 $\frac{1}{4}$; $\frac{1}{3}$¢ **10** $78 **11** 14\frac{1}{12}$

	a	b		a	b
Page 83, Ex. I—1	36$\frac{2}{3}$	36$\frac{1}{4}$	**3**	115$\frac{5}{8}$	130$\frac{1}{12}$
2	53$\frac{7}{8}$	67$\frac{1}{12}$	**4**	190$\frac{2}{3}$	215$\frac{1}{4}$

Ex. II—1 24 **2** 36 **3** 45 **4** 45 **5** 45 **6** 36
Ex. III—1 8 **2** 12 **3** 16 **4** 28
Page 84—1 331\frac{1}{2}$ **2** $80.50 **3** 59 doz. **4** 72 **5** 38\frac{1}{4}$ **6** 464
7 30 **8** 48 doz. **9** 8 **10** $35 **11** $12.50 **12** 51 **13** 21

Page 85 — **1** 54 lb. **2** $2.08 **3** 126 sq. ft. **4** 84¢ **5** $17¼ **6** 24 yd.
7 $52¼ **8** $893.75 **9** $2.25 **10** 33½¢ ; $2.66¾ **11** 720 lb. **12** $1200
Page 86, Ex. I — **1** 80 da. **2** $3.29
Ex. II — **1** 22⅖¢ **2** 960 mi. **3** 51 pk. **4** 77 ft. **5** 1305 min.
6 197 mo. **7** 211 in. **8** 737½¢ **9** 36 bu.

	a	b	c		a	b	c
Page 88, Ex. II — **1**	$61\frac{3}{10}$	$65\frac{1}{10}$	38	**3**	$40\frac{1}{10}$	$111\frac{9}{10}$	$30\frac{1}{2}$
2	$44\frac{7}{10}$	$24\frac{3}{10}$	$8\frac{8}{10}$	**4**	$68\frac{1}{2}$	$54\frac{1}{2}$	$129\frac{1}{2}$

	a	b	c		a	b	c
Page 89, Ex. I — **1**	$6\frac{4}{5}$	$26\frac{1}{2}$	$42\frac{9}{10}$	**3**	$35\frac{9}{10}$	$25\frac{9}{10}$	$45\frac{7}{10}$
2	$45\frac{9}{10}$	$45\frac{7}{10}$	$34\frac{1}{10}$				

	a	b	c		a	b	c
Ex. II — **1**	$171\frac{1}{2}$	58	$331\frac{1}{2}$	**4**	$292\frac{4}{5}$	$569\frac{7}{10}$	$652\frac{4}{5}$
2	$229\frac{1}{5}$	$110\frac{1}{10}$	$998\frac{2}{5}$	**5**	$275\frac{4}{5}$	$364\frac{1}{2}$	$1232\frac{7}{10}$
3	$254\frac{7}{10}$	$342\frac{2}{5}$	$394\frac{4}{5}$				

	a	b	c		a	b	c
Page 90, Ex. I —		1	8	8	7	**2** 8	16	7

Page 91 — **1** $2.39½ **2** 100 **3** $4½ **4** $⅘ **5** 25 lb. **6** 60 **7** $31¼
8 $7.87½ **9** $⅔ ; ²⁵ **10** $61⅘ **11** $191\frac{7}{10}$ A.
Page 92, Ex. I — **1** $29 **2** 87 yd. **3** 2048 **4** 495 ft. ; 43½ ft.
5 $3.06 **6** $57⅘ **7** $43½ **8** $1.33¼ **9** $1.37\frac{7}{10}$

	a	b		a	b
Ex. II —	**1** 30¢	30¢	**3** 10¢	10¢
	2 90¢	70¢		

Page 93 — **1** $24½ **2** 30¢ **3** $11.87½ **4** 4 da. **5** $26 **6** $100
7 $24 **8** 162 mi.

	a	b	c		a	b	c
Page 95, Ex. II — **1**	$37\frac{7}{10}$	$63\frac{8}{10}$	$56\frac{1}{2}$	**3**	$50\frac{1}{10}$	$81\frac{3}{10}$	$58\frac{1}{3}$
2	$43\frac{9}{10}$	$45\frac{1}{4}$	$65\frac{1}{2}$				

	a	b	c		a	b	c
Ex. III — **1**	$6\frac{9}{10}$	$9\frac{1}{10}$	$2\frac{9}{10}$	**2**	$4\frac{7}{10}$	$48\frac{7}{10}$	$25\frac{9}{10}$

Page 101, Ex. II — **1** 141.92 **2** 166.51 **3** 261.81 **4** 245.27 **5** 48.15
Page 102, Ex. I — **1** 2.68 **2** 31.685 **3** 40.271

	a	b		a	b		a	b
Page 103, Ex. I — **1**	12.1	7.04	**3**	7.94	.11	**5**	5.88	90.702
2	36.5	3.175	**4**	19.12	4.675			

Page 104, Ex. II — **8** 2.16 **9** 11.34 **10** 3.92 **11** 5.04 **12** 1.304
13 5.832 **14** 82.76 **15** 11.7 **16** 27 **17** 34.8 **18** 25.2 **19** 34.2 **20** 60.2
21 74.7

	a	b	c	d		a	b	c	d
Ex. III — **1**	40.5	5.7	19.2	34.2	**3**	98.42	21	115.2	164.5
2	74.4	18.2	4.06	67.2	**4**	.3	23.2	79.5	159.1

	a	b	c		a	b	c
Page 105, Ex. I — **1**	1.44	9.66	69.75	**4**	96.6	.128	12.72
2	331.1	96.6	97.75	**5**	9.66	.637	383.4
3	258.4	96.6	35.31				

	a	b	c		a	b	c
Ex. II—1	51.46	8.52	9.702	3	15.52	30.42	1.704
2	78.02	16.17	14.67	4	13.23	169.20	3.144

Page 106, Ex. II—5 4.16   **6** 4.72   **7** 8.25   **8** 9.36

	a	b	c		a	b	c
1	2.41	3.15	4.36	3	2.17	4.62	4.73
2	2.16	3.71	5.61	4	3.16	3.76	7.21

	a	b	c		a	b	c
Page 107—1	31.8	9.7	121.3	5	26.7	5.3	137.4
2	18.7	5.4	129.6	6	41.3	8.3	7.83
3	24.2	7.5	321.5	7	12.8	37.2	63.7
4	18.6	4.2	32.4	8	34.6	53.6	73.6

	a	b	c		a	b	c		a	b	c
Page 108, Ex. I—1	25	74	125	2	85	45	176	3	35	45	182

	a	b	c		a	b	c
Ex. II—1	43.63	7.26	47.026	5	7.26	9.7	2.9
2	15.85	803	724.21	6	9.7	7.26	38
3	478.8	1915.21	77	7	84	86	2.7
4	200.75	1806.75	6.105				

	a	b	c		a	b	c
Page 110, Ex. I—1	3.2	7.2	.83	3	6.4	5.4	.77
2	.21	9.2	.82	4	8.3	3.7	.58

Ex. II—1 $12.37½ ; $18.70   **2** 123.35 A.   **3** $18.675   **4** 100 bu.
5 $50   **6** 4.31 mi.   **7** 21 bbl.   **8** $5.6875
Page 111—1 29¾   **2** $50   **3** $5.59   **4** 25 bu.   **5** $1.305 ; $1.45
6 $8.80   **7** 4.83 da.   **8** $973.10   **9** $31.20   **10** $7.955   **11** $6.60
Page 112—1 $100   **2** 200 lb.   **3** 160 min.   **4** $2.50   **5** 31 yd.
6 68.45 mi.   **7** $9.36   **8** $3.9875   **9** 20.6 lb.   **10** 56 bbl.   **11** $65
Page 113—1 1.98   **2** 3.51   **3** 37 lb.   **4** 125 ; 100 ; 120   **5** $14¼
6 $71.44 ; 114 bu.   **7** $1600, wife ; $800, each child   **8** 135 lb.
Page 115—13 ½ ; ⅓   **14** $45.435
Page 116—1 $38.225   **2** 105 bu.   **3** 14   **4** $292.95   **5** $14,140.50
6 56.7 T.   **7** $.90   **8** 54 yd.
Page 117—1 $48.30   **2** $29.24   **3** $18.52   **4** $3.50   **5.** $37.15
6 $61.20   **7** $301.25
Page 118—1 $108.992   **2** $19.14   **3** $197.235   **4** $61.144   **5** $22.104
6 $37.38   **7** $142.45   **8** $2904.25
Page 119—1 $52.584   **2** $117.04   **3** $ 249.925   **4** $76.781   **5** $.75
6 $.05   **7** $.005
Page 120—1 $66.725   **2** 20,000 lb.   **3** $1134   **4** 6000 lb.   **5** $15.50
6 $966   **7** $82.56   **8** 74   **9** 72 bu.   **10** $75   **11** $214.50
Page 122—1 $49.99   **2** $55.88
Page 123—1 $84.49¼   **2** $61.06¼
Page 124—1 $785.266   **2** $1752.50   **3** $410.66
Page 125— Bal. due Singer, $102.50
Page 126—1 Due Williams, $15.78   **2** Due Kent, Lowben and Co., $1265.50
Page 127—1 $32.85   **2** $346.25
Page 128—1 $39.15   **2** Due Robbins, $68.40

	a	*b*	*a*	*b*
Page 130 —	1 864 in.	770 yd.	4 1032 in.	13.5 ft.
	2 2200 yd.	271 ft.	5 585 in.	480 rd.
	3 4400 yd.	82½ ft.	6 3520 yd.	1980 yd.

7 1118 in.   8 1341 in.   9 4128 in.   10 4907 in.

Page 131 — 1 31 sq. ft.   2 74½ sq. yd.   3 88,776 sq. in.   4 21 pt.
5 62 gi.   6 85 qt.   7 271 pt.   8 203 oz.   9 575 lb.   10 16,400 lb.   11 400
sq. rd.   12 160 rd.   13 30,014 sec.   14 234 hr.   15 33 doz.   16 129 sheets
17 480 quires   18 15,200 lb.   19 7604 ft.   20 1960 min.

Page 132 — 1 3 rd. 4½ yd. 7 in.   2 42 rd. 4 yd.   3 1 mi. 199 rd. 1¼
yd. 2 ft.   4 2 sq. yd. 8 sq. in.   5 7 bu. 1 pk. 6 qt.   6 4 T. 7 cwt. 60 lb.
7 5 da. 11 hr. 4 min.   8 5 A. 76 sq. rd.   9 40 gal. 2 qt.   10 2 mi. 13 rd.
½ yd.   11 846 bu.   12 15 wk. 4 da. 9 hr. 40 min.   13 3 mi. 57 rd. 2½ yd.
2 in.

Page 133 — 1 17 mi. 145 rd. 3 yd. 0 ft. 2 in.   2 22 mi. 86 rd. 2 yd. 0 ft.
9 in.   3 57 mi. 87 rd. 1 yd. 2 ft. 2 in.   4 115 mi. 32 rd. 2 yd. 0 ft. 10 in.

Page 134 — 1 22 gal. 1 qt. 1 pt.   2 13 bu. 3 pk. 6 qt. 0 pt.   3 20 gal.
2 qt. 0 pt.   4 45 hr. 37 min. 22 sec.   5 14 wk. 0 da. 21 hr.   6 18 T. 8 lb.
7 23 bu. 1 pk. 5 qt.   8 30 yr. 0 mo.   9 24 sq. yd. 0 sq. ft. 59 sq. in.
10 32 wk. 2 da. 23 hr.   11 86 mi. 40 rd. 5 yd. 1 ft. 5 in.   12 39 bu. 3 pk.
3 qt. 1 pt.   13 53 lb. 10 oz.   14 533 gal. 3 qt. 1 pt. 2 gi.

Page 135 — 1 16 rd. 10½ ft. 2 in.   2 64 rd. 0 yd. 1 ft. 10 in.   3 24 mi.
286 rd. 1 yd.   4 7 bu. 3 pk. 2 qt.   5 4 gal. 2 qt. 1 pt.   6 16 wk. 5 da. 21 hr.
7 18 da. 20 hr. 40 min.   8 10 lb. 11 oz.

Page 136, Ex. I — 1 35 yd. 1 ft. 4 in.   2 47 bu. 1 pk. 6 qt.   3 55 gal
0 qt. 1 pt.

	a	*b*
Ex. II —	1 22 wk. 2 da. 1 hr.	129 yr. 6 mo.
	2 36 hr. 43 min. 3 sec.	43 sq. ft. 12 sq. in.
	3 107 mi. 162 rd. 4 yd.	127 gal. 1 pt.
	4 453 lb. 11 oz.	113 T. 880 lb.
	5 143 yd. 4 in.	222 qt.

	a	*b*
Page 137 —	1 16 yd. 2 ft.	3 hr. 12 min. 18 sec.
	2 3 bu. 2 pk. 5 qt.	8 T. 460 lb.
	3 6 gal. 3 qt. 1 pt.	7 yd. 2 ft. 7 in.

4 $3.84   5 1 hr. 14 min. 12 sec.   6 1 bu. 2 pk. 3 qt.   7 67 yr. 10 mo.
8 73 yr. 2 mo. 6 da.

Page 140 — 1 208 sq. in.   2 4 ft.   3 288 sq. ft.   4 12 ft.   5 24 yd.
6 66 sq. yd.   7 400 sq. rd.   8 20 A.   9 15 ft.

Page 141 — 1 356 rd.   2 550 sq. yd.   3 240 yd.   4 20 yd. ; $25
5 49 yd.

Page 142, Ex. I — 1 36 yd.   2 $68.80

Ex. II — 1 1232 sq. ft.   2 616 sq. ft.

Page 143 — 1 8000 sq. ft.   2 594 sq. ft.   3 1120 sq. rd.   4 3½ A.

Page 144 — 1 910 sq. ft.   2 480 sq. ft.   3 Fig. 1, 62.5 sq. ft. ; Fig. 2,
93.75 sq. ft. ; Fig. 3, 312.5 sq. ft. ; Fig. 4, 162.5 sq. ft. ; Fig. 5, 218.75 sq.
ft. ; Fig. 6, 240 sq. ft. ; Fig. 7, 384 sq. ft.

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